

Mining

CONGRESS JOURNAL



MARCH
1946



You get maximum loading density with GELEX in perforated cartridges



← AT LEFT

Two cartridges of Du Pont "Gelex" shown in cross-section of drill hole. Note the perforations. When cartridges are tamped, perforations allow wrappers to unwind so that cartridges expand. Loading is easier and quicker. Slitting is unnecessary. You handle cartridges less.

→ AT RIGHT

Sketch shows how "Gelex" cartridges expand to give better loading density. Tamping has compressed cartridges so they completely fill the hole . . . concentrating the charge where it will do the most work. No raveling in uppers! The charge stays put.

"Gelex" is a semi-gelatinous, medium-velocity dynamite with a strong, shattering action that gives excellent fragmentation . . . reduces "pop" shooting. Speeds mechanical loading . . . saves wear and tear on equipment. Fumes are good . . . permitting quick return to the face. Try "Gelex" in perforated cartridges. They will help you get more tons of ore at lower cost per shift. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Delaware.

DU PONT GELEX

A Product of Du Pont Explosives Research



BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

Mining

CONGRESS JOURNAL

Contents

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FRONT COVER: Automatic Dumping at an Ore Pass of Anaconda Copper Mining Company, at Butte, Mont.

	Page
EDITORIALS	23
A BOTTOM DUMP SKIP AT BUTTE.....	24
By W. R. CATROW	
SAFETY IN POWER DISTRIBUTION FOR COAL MINES.....	27
By R. G. GEHLSSEN	
A NEW IDEA IN DRILL BOOSTERS.....	30
By JULIAN A. FULLER	
FLOOD PREVENTION AND CONTROL IN THE ANTHRACITE REGION.....	32
By S. H. ASH	
MERCURY MEANDERINGS—PART II.....	35
By WORTHEN BRADLEY	
ANNUAL COAL CONVENTION.....	42
SERVICE HAULAGE UNDER VARIOUS SEAM CONDITIONS.....	44
By the COMMITTEE ON MECHANICAL LOADING	
MINING CONGRESS HOLDS FORTY-EIGHTH ANNUAL MEETING.....	48
Report of Julian D. Conover, Secretary.....	50
Declaration of Policy	56
COAL DUST SUPPRESSION BY WATER INFUSION.....	60
WHEELS OF GOVERNMENT	63
PERSONALS	65
NEWS AND VIEWS	69
MANUFACTURERS FORUM	78

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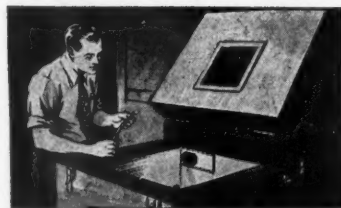




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THE PENGUIN'S chilly tail is nothing, compared with the chilly tale of the freezing test to which we submit U. S. Royal Cords and Cables.

Exposure to sub-arctic temperature is one of a series of ordeals they must undergo to prove their qualifications for your service. U. S. Royal Cables are subjected to terrific heat, they are stretched, pounded, bent, twisted and soaked in water. But when they survive all this they are genuinely "Safety Tested". That is why U. S. Royal Mining Machine and Locomotive Cables will meet your expectations in every way.



DEEP FREEZE TEST—Scientists—using specially designed equipment—subject U. S. Mining Machine and Locomotive Cables to a cold rarely encountered by man...minus 70 degrees F. This is one of the several ways of testing the dependability of U. S. Royals.

THE NEW U. S. ROYAL *Safety Tested* MINING MACHINE AND LOCOMOTIVE CABLES



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MINE CAR WHEELS MAY LOOK ALIKE..



but actual service will show the difference

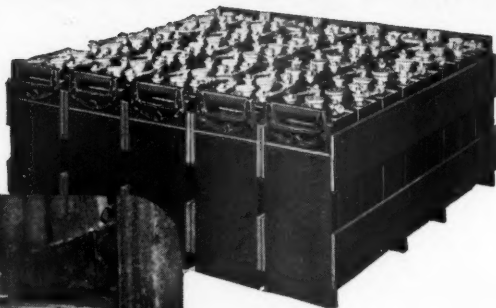
In mine car wheels, it's the ingredients and manufacturing procedure that counts! Actual operating conditions prove the superiority of A.C.F. Mine Car Wheels—scientifically produced under strict supervision of our skilled Research Staff. Controlled HEAT treatment in the

manufacturing process produces "tough" wheels which give you those EXTRA miles of service. You can be sure that there is no compromise with quality in A.C.F. Mine Car Wheels! Talk over your wheel problems with our Sales Representatives; they are always anxious to serve you.

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IT'S THE TONNAGE THEY DELIVER THAT COUNTS

In Mine Locomotives and Shuttle Cars Alkaline Batteries Give You These Important Advantages

- They are **durable mechanically**; grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They are **foolproof electrically**; are not injured by short circuiting, reverse charging or similar accidents.
- They can be **charged rapidly**; do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- They **withstand temperature extremes**; are free from freezing hazard; are easily ventilated for rapid cooling.
- They can **stand idle indefinitely** without injury. Merely discharge, short-circuit, and store in a clean, dry place.
- They are **simple and easy to maintain**.

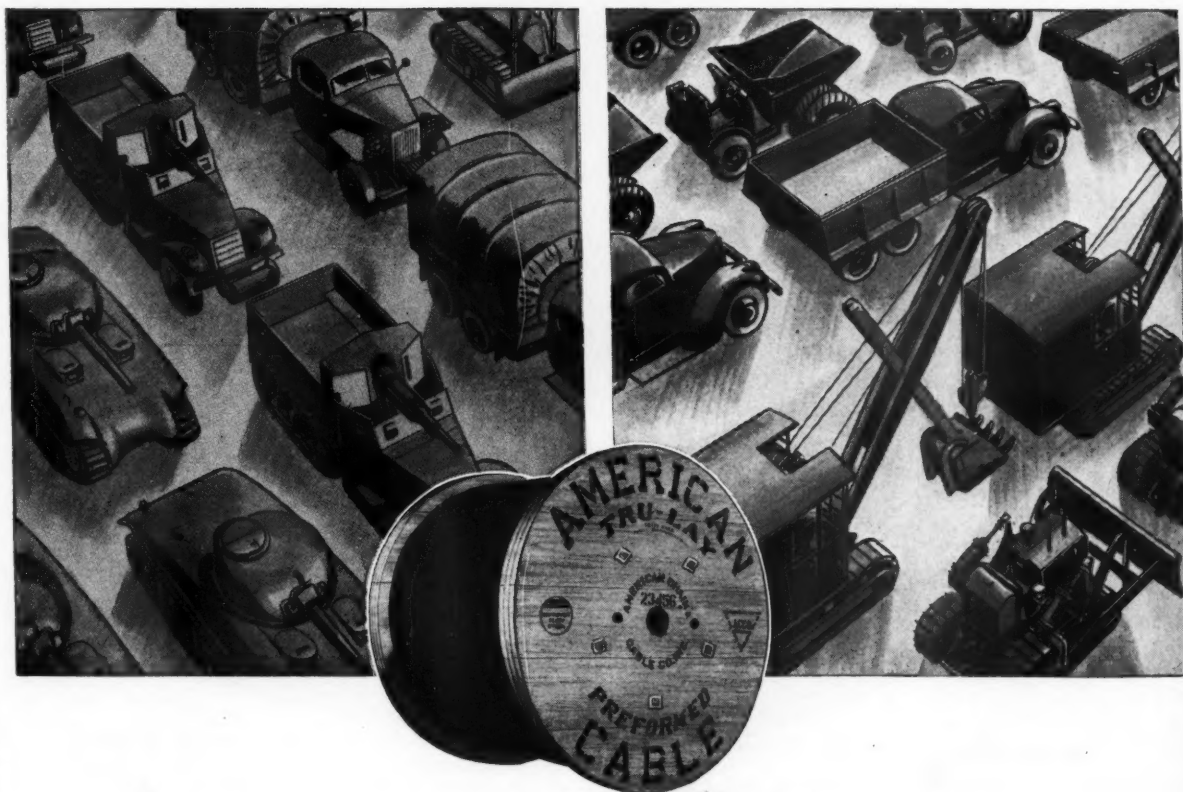
Keeping maximum production of coal or ore coming out puts a premium on availability of underground haulage and tramming equipment.

Time and experience have demonstrated that the unequaled dependability of Edison alkaline batteries gives the closest approach to failure-free, uninterrupted haulage it is possible to obtain. They stay on the job and out of the repair shop . . . give longer service life than any other type of battery. In fact, alkaline batteries that have been "worn out" in locomotive or shuttle-car service, are often used for various kinds of lighter duty standby work for which their capacity is still ample, and there deliver more years of dependable service.

Because they give such long, trouble-free life and are so simple to maintain, alkaline batteries also help keep down haulage costs. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.*

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ALKALINE BATTERIES

a Plan for ***NOW!***



3,000,000 jobs are now ready, thanks to the American Road Builders' Association. That organization sponsored a bill (now authorized by Congress) to provide one and one-half billion dollars of Federal money for road repair and new highway construction. To receive its share of these funds, each state must match its Federal request with a like amount of its own.

Here is a sound plan for putting returning veterans, and dislocated war workers to work on needed highway, bridge and airport construction. It will make work for millions more in durable and consumer goods industries. It will benefit all America by providing necessary facilities and helping stabilize our post-war economy. For full information regarding this vital plan get free copies of the illustrated booklets titled: "The Road Ahead" and "Put Your Town on the Air Map." Get them by dropping a card to the American Road Builders' Association, 1319 F Street, N.W., Washington, D. C.



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In Business for Your Safety

**G.E. ANNOUNCES FIRST
SAFETY-ENCLOSED PORTABLE
RECTIFIER-SUBSTATION**

DESIGNED TO GIVE YOU

Greater Safety

"Dirt stays out!"

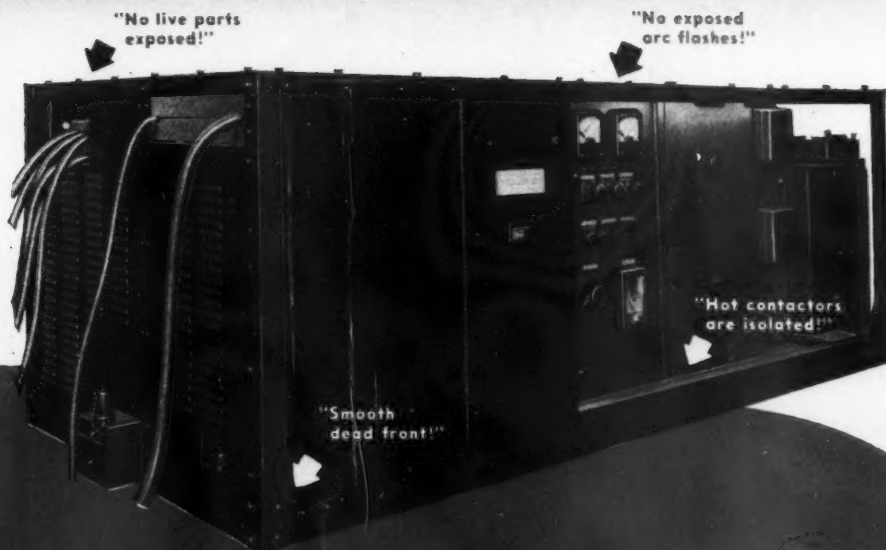
"Dripping water
can't get in!"



"Easy to run up
near working face!"

"Panels come
off easily!"

"Low-slung to fit
into cramped areas!"



UNDERGROUND!

Here it is—another G-E "first"—the portable rectifier substation you asked us to design. Ten years of successful mine-rectifier experience has gone into this new safety-enclosed unit. Now it's easier and safer than ever before to maintain full voltage for "all out" operation of mechanized mining equipment. This substation gives greater assurance of operating continuity. It simplifies maintenance.

Note the clean, dead-front appearance of the equipment on all sides. Even in cramped underground locations, men can't accidentally touch "live" parts, nor are there any arcs visible when contactors are in operation. The equipment is also protected from adverse conditions. The sealed-ignitron mercury-arc rectifier is a "natural" for underground mining where dust and dirt offer a threat to rotating equipment.

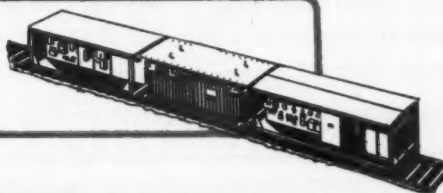
Fast, easy maintenance!

We've made these new substations particularly easy to inspect and maintain. Top panels are segmented for easy entry into any one section.

All side panels are quickly removed. Swinging doors permit easy access to frequently inspected areas. In other words, even though G-E portable substations are enclosed, your maintenance men can still get at inside controls and wiring quickly and easily.

If you have hesitated to use underground substations because of safety and maintenance problems, here's your chance to get full-voltage power and high output in a safe, easy-to-use equipment. These new portable units can take plenty of abuse and still stay on the job. Write or phone our nearest office for complete details. Apparatus Dept., General Electric Co., Schenectady 5, N. Y.

A complete G-E portable rectifier substation consists of automatic a-c switchgear, Pyranol transformer, and rectifier with d-c switchgear. Each unit is cur-mouted. Portable substations allow conversion to direct current thousands of feet closer to the working face, thereby making long, low-voltage d-c feeders unnecessary, and assuring full voltage for efficient operation of cutters, loaders, and conveyors.



**Portable
RECTIFIER
SUBSTATIONS**

GENERAL  ELECTRIC

607-52-140, 204



Strong as a Bull Faithful as a Dog!...

THE Mack Bulldog shown here was picked to do the job of extreme heavy hauling for the well-known Cleveland Cartage Company of Ohio. Like every Mack, this model has strength, reliability and the power-to-do-the-job built right into it. It has a gasoline engine of 707 cubic inches capacity, a braking surface of 1,207 square inches and is shown hauling a load of 79 tons. On the low side of transmission, it has a maximum speed of 14 mph and on the high side 31 mph—and can climb an 18%

grade with a 60-ton pay load.

And the Cleveland Cartage Company knows from experience how "faithful" a Mack truck is, too . . . For 20 long years the old Model 26 Mack Bulldog pulled their largest carry-all.

The Mack Bulldog is the symbol of strength and reliability in trucks the world around. If you're looking for trouble-free performance, long-run economy, more work for your money—it will pay you to look at Mack first!

Mack TRUCKS
FOR EVERY PURPOSE



**Performance
Counts**

Mack Trucks, Inc., Empire State Building, New York 1, N. Y.; Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

READY TO FABRICATE SURPLUS

Aluminum

AT 15% TO 45% LESS

(FOB Location)

GOVERNMENT-OWNED STOCK

Here—in production quantities—is the aluminum you need at fixed prices, 15% to 45% off current mill prices, depending on the particular alloy. Much of this special value stock, originally ordered for war plane construction, is still in its original packing. It may be readily fabricated and is available in standard sizes and shapes. Perhaps this material is just what you need to get into full civilian production faster and it costs nothing to find out. Take these three simple steps today:

1. Estimate, for any convenient period, your production needs in each specification, finish, gauge, etc.
2. Then write, wire, or phone that data to your nearest War Assets Corporation office* below. We will advise you of the location of the stock you need, estimate possible delivery dates, quote prices and help arrange credit where indicated.
3. When satisfactory arrangements have been made, we will start shipments.

* NEW SURPLUS STOCK RELEASED DAILY

War Assets Corporation is a Reconstruction Finance Corporation subsidiary in charge of disposing of surplus war materials constantly being released to War Assets Corporation. To reach War Assets Corporation, simply contact your nearest R.F.C. office listed below.

VETERANS OF WORLD WAR II:

To help you in purchasing surplus property from War Assets Corporation, a veterans' unit has been established in each War Assets Corporation Regional Office listed below.

ATTENTION

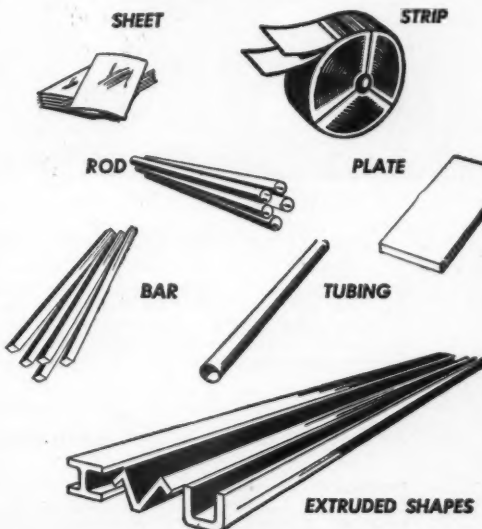
POWDER

METALLURGISTS!

Atomized Aluminum powder—not suitable for paint without further processing—is available in enormous quantities at 10¢ per pound. Can you find a major use for this product? If you can...!!! Get detailed specifications from your War Assets Corporation office listed below.



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A DISPOSAL AGENCY DESIGNATED BY THE SURPLUS PROPERTY ADMINISTRATION for Surplus Producers' and Capital Goods. Aircraft and Plants formerly handled by Reconstruction Finance Corporation... Finance Corporation Consumer and for Surplus Consumer Goods formerly handled by United States Department of Commerce.

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187-2

Where the goings **TOUGHEST**— YOU CAN BET YOUR LIFE ON *Scott Air-Pak*

The Inside Picture Story of a Western Metal Mine Fire

Below:—Specialists on mine fire-fighting complete a fire brattice by guniting. Members of the crew expressed a preference for the Scott Air-Pak and its fresh, cool *Certified Pure* air supply.



Left:—Members of the crew of trained fire-fighters applying water to the hanging-wall side of the vein where smoke was discovered issuing from an old timbered raise. The Scott Air-Pak's ample air supply lent speed to the effort.

Below:—Entering a breathing hazard zone, three fire-fighters are equipped with Scott Air-Paks flown to the fire by airplane from the Lancaster, New York, Scott factory. Clear vision from fog-free lenses won instant praise for the equipment.



The Dramatic Story of the Scott Air-Pak in Service

at a recent fire in a large western metal mine, is vividly portrayed in the photographs above. In all, 15 Scott Air-Paks were in constant use during the days spent in bringing the fire under control, and during this period, 15 more Scott Air-Paks were ordered by the mining company and have since been delivered. Here are some of the points of Scott Air-Pak's superiority stressed by the crew of fire-fighters who had their introduction to the equipment at that time:

Preferred by Experienced Fire-Fighters Because . . .

Practically no instruction is required in the use of the equipment. * The cool, dry air within the mask prevents all lens fogging and is invigorating. * There is no nose clip to come off accidentally while working in a breathing hazard. * The dual gages, both on the cylinder and the regulator, provide a double check on the remaining pressure at all times. * The extreme simplicity in the testing and operation of the equipment and also in its maintenance sets the Scott Air-Pak out

in front. * The difficulties and dangers of leaks common to oxygen equipment, are eliminated in the Air-Pak. * The diaphragm exhalation valve permits conversation within a reasonable range. * In use, the Scott Air-Pak harness gives the wearer complete freedom of motion—no confinement of activity. * These and many additional features earned for the Scott Air-Pak—the decided preference over all other self-contained breathing equipment available at the scene.

Write for free demonstration or catalog giving complete details of the Scott Air-Pak.
Act today—you never know when an emergency will arise.

SCOTT AVIATION CORP. 233 ERIE STREET
LANCASTER, N. Y.



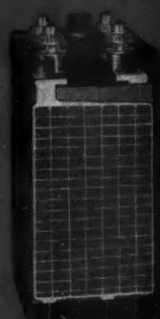
MEMO

*Can we handle
50 extra tons
from Section
16 today?*

GENERAL MANAGER

**Do you have RESERVE
POWER for**

Emergencies?



SEDIMENT CHAMBER
Kathanode-Unit protection
permits larger plates and
greater capacity in same over-
all size battery cell.



**GOULD STORAGE BATTERY
CORPORATION, Dept. M. Y.**

Factories: Atlanta • Boston • Chicago
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Saint Paul • Salem • New City
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Gould Kathanode power helps your shuttle cars to meet unexpected situations. In an emergency there is current for sustained speed or for adding another load or two during a busy day.

In a Gould Kathanode battery the extra protection of the famous Kathanode Unit minimizes active-material losses. A smaller sediment chamber is practical. That means larger plates, actually a larger battery in the same over-all size container. Under ordinary conditions a Gould Kathanode does not work at full power. In an emergency you can depend on it for reserve power.

Write Dept. 133 for Catalog 300 on Gould Kathanode Glassklad Batteries for Mine Shuttle Car Service.





FOR ALL SHIPPERS—the Union Pacific Railroad provides . . .

A Strategic Middle Route that unites the East with the Mid-West, Inter-mountain and all Pacific Coast states.

Modern operating facilities, equipment and motive power include the famous "Big Boys," super-powered locomotives designed to meet industry's heaviest demands.

Union Pacific also has long been renowned for its well-ballasted steel highway, specially constructed for

smooth, safe operation of freight traffic at high speed.

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For dependable, on-the-job freight service—

*Be Specific—
say "Union Pacific"*



★ Union Pacific will, upon request, furnish information about available industrial and mercantile sites in the territory it serves. Address Union Pacific Railroad, Omaha, Nebraska.

The Progressive

UNION PACIFIC RAILROAD
The Strategic Middle Route

Companions in **FASTER** COAL - CUTTING

KENNAMETAL UNDERCUTTER BITS

The efficiency of every machine—and man—in your mine depends upon the small edge of the undercutter bit. For, before coal can be drilled, blasted, loaded, and transported, it must be cut.

Faster—Tough, hard Kennametal tips cut through normal face with less power; slice across more places before becoming dull.

Better—Less "bug-dust"; cleaner cutting close to bottom; harder cutting jobs made easy.

Cheaper—Exceptionally long life; idle machine time minimized; skilled men do more productive coal cutting, less unproductive bit changing.

Here's a typical performance report: With steel bits it took 2 hours to cut across 22 foot place in sulphur-streaked coal—three bit changes. Kennametal did same job in 15 minutes—no bit changes.

*Kennametal Undercutter Bits are available
for most standard chains.*

KENNAMETAL DRILL BITS

Distinctive two-way drill bits also have brazed-in Kennametal tips, with cutting edges contoured for fast, uninterrupted drilling to accurate size throughout bit life, including many regrinds. Six sizes available, ranging from 1½" to 3", for hand-held, and track or post-mounted machines.

Augers are also made by Kennametal. Solid-center, heat-treated rolled steel shapes, to minimize whip. Double spiral for efficient hole cleaning. Driving shanks shaped for quick "twist of wrist" change.

These are representative results: One Kennametal bit drilled 275 feet of blast hole in bottom rock; another 850 feet in coal—before resharpening was necessary.

AND FOR MORE EFFICIENT STRIPPING

Kennametal Inc. produces four sizes of three-way drill bits—3½", 4", 5", and 6½", having cutting tips of Kennametal. They are speeding drilling operations in major stripping pits. One operator reports, "6½" Kennametal Bit drilled 900 feet, and wasn't dull enough to need resharpening". Another states, "A Kennametal Bit, used for a month, is still cutting faster than any other type bit we ever used."

Catalog M-1—giving specifications and prices of Kennametal Bits and Augers—will be sent promptly, upon request.



KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

ACCLAIMED
THE MACHINE OF TOMORROW
FOR TODAY'S TOUGH DIGGING JOBS

6
CU.YDS.

The New
MARION
151-M

BECAUSE OF THESE PROVEN FEATURES:

Outside Dipper Handle.

Two-piece Dipper.

Single Hitch to Dipper.

Amplidyne — Rototrol Control.

Modern Design.

Sturdy Construction.

Ample Speed, Power, and Weight.

A Real Rock Shovel.

WHAT IS YOUR MATERIAL HANDLING PROBLEM?



THE MARION STEAM SHOVEL COMPANY

MARION, OHIO • Offices and Warehouses in all Principal Cities • $\frac{3}{4}$ CU. YD. to 40 CU. YDS.

"WHEELBARROW" EFFICIENCY



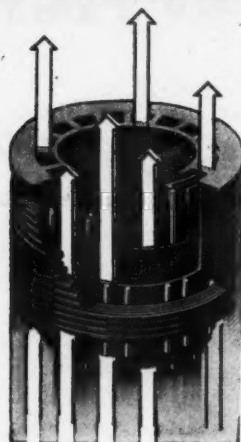
Profit in coal
can be assured
only by modern
efficient selling;
reaching ALL
of the RIGHT
MARKETS for

YOUR PARTICULAR COAL.
Our far-flung organization
covering twenty-six states
and the Great Lakes area
offers just that efficiency.

THE CLEVELAND-CLIFFS IRON COMPANY

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

underground



Air performs a double duty in the ASL—(1) it insulates (2) it carries heat away—with only one heat transfer. Chimney-like construction assures a strong natural draft which cleans as it cools.

150 OR 3750 KVA



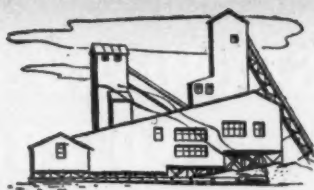
- ▶ **Minimum fire or explosion hazard.**
- ▶ **No catch basins required.** Install indoors overhead . . . or in remote or near remote underground places.
- ▶ **Weights 25 to 50% less than** comparable liquid-filled units . . . easier to move to load centers . . . requires less space.
- ▶ **Low maintenance**—not susceptible to moisture or condensation. No gaskets—no fittings to inspect and maintain.
- ▶ **High short-time overload capacity** . . . glass and porcelain insulation used are not affected by operating temperatures.
- ▶ **Complete lightning protection** possible with valve-type arresters.



Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

OPERATING PARTNER IN THE
[Page 16]

or indoors

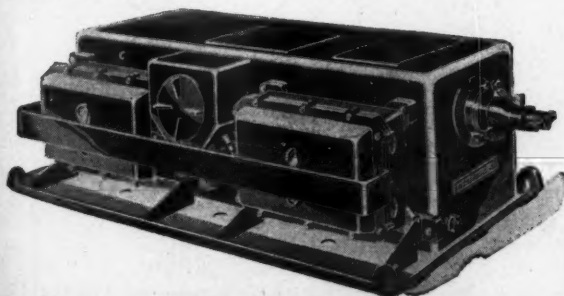


6 REASONS WHY WESTINGHOUSE ASL DRY-TYPE TRANSFORMERS ARE RECOMMENDED



Typical mining installation. The three ASL transformers shown here are rated 150 kva each . . . installed underground in an ore mine.

Designer's conception of the future Power Center for underground service in mines.



Both dry and liquid-filled transformers are made by Westinghouse—and the principle guiding their application is simply this: The right transformer on the right job. Westinghouse makes the Inerteen-filled transformer, which in many applications is unsurpassed by either oil or air-cooled transformers.

But for mining applications—either below or above ground — Westinghouse strongly recommends air-cooled, dry-type transformers. Type ASL transformers have rolled up a performance record which makes their application in mine service a first consideration.

Since the first Westinghouse ASL transformer was built nearly 10 years ago (rated at 500 kva, 13,200 volts) the demand for this product has been steadily growing. Now more than 2,000 Westinghouse ASL transformers, with a total capacity of over 1,000,000 kva, have established a performance record unsurpassed by any other type of transformer.

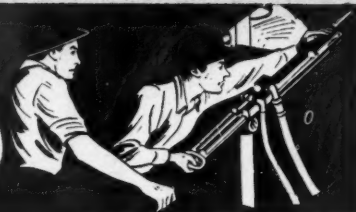
Over a period of five years, hundreds of ASL transformers have been placed underground in all types of mining service . . . and to date, we have not heard of a single failure. Moisture, dust or rough handling have not affected their continuous operation.

With such a performance record, in mines of all types, ASL transformers are a "natural" where dependability is a must.

Whether you are planning a transformer installation near the mine face, or above ground, Westinghouse will be glad to render engineering assistance to help you put the right transformer on the job. Westinghouse will help you apply the dry-type and liquid-filled transformers in their correct applications. For complete information, call your Westinghouse office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-94696

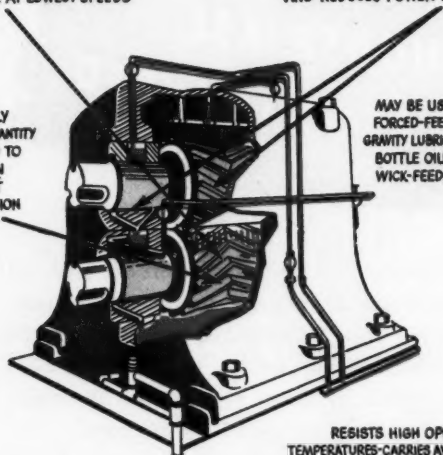
STANDARD ENGINEERS NOTEBOOK



EXTREME PRESSURE ADDITIVE
PREVENTS LUBRICANT FILM
RUPTURE AT LOWEST SPEEDS

HIGH AFFINITY FOR METAL KEEPS
LUBRICANT ON BEARING SURFACES
AND REDUCES POWER LOSS

RELATIVELY
SMALL QUANTITY
REQUIRED TO
MAINTAIN
EFFICIENT
LUBRICATION



MAY BE USED IN
FORCED-FEED AND
GRAVITY LUBRICATORS,
BOTTLE OILERS AND
WICK-FEED CUPS

RESISTS HIGH OPERATING
TEMPERATURES-CARRIES AWAY HEAT

Metal-adherent oils cut heavy-duty gear wear

Because they are viscous and extremely tacky, Calol Vistac Oils stick tightly to all metal surfaces. This quality, plus an unusual film strength obtained from special oiliness and extreme pressure compounds, gives them the ability to protect gears, such as heavy industrial reduction sets, on which extreme pressures are exerted over wide areas for a relatively long time.

Calol Vistac Oils are extremely efficient. Adequate quantities for safe operation may be supplied by the usual lubrication methods — force-feed and gravity lubricators and sight-feed cups; the lighter grades by bottle oilers and wick-feed cups.

In addition to gear lubrication, Calol Vistac Oils are used in rock drills, jackhammers and other air tools. They atomize quickly, are stable and flow easily in cold temperatures. They are made in six grades: 9X (SAE 10), 14X (SAE 20), 19X (SAE 40), 36X (SAE 40), 45X (SAE 40).

For additional information and the name of your nearest Distributor, write Standard of California, 225 Bush Street, San Francisco 20, Calif.; The California Oil Company, 30 Rockefeller Plaza, New York 20, N. Y.; The California Company, 17th and Stout Streets, Denver 1, Col.; Standard Oil Company of Texas, El Paso, Texas.

Stable oils produce uni- form hardness in steel

Because they retain their original viscosities in continued use, Calol Quenching Oils maintain a constant quenching speed and produce uniform hardness in steels. They have a high resistance to oxidation, contain no fatty oils to produce disagreeable vapors.

Calol Alloy Quenching Oil consistently and quickly produces higher hardness in alloy steels. Its unusual cooling power is based on what is believed a new principle. Unlike water, it eliminates the chance of brittleness, distortion or cracks.

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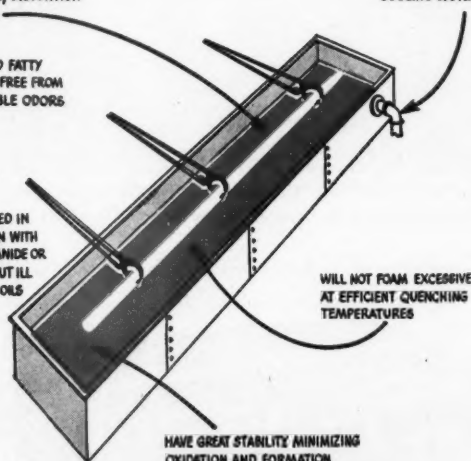
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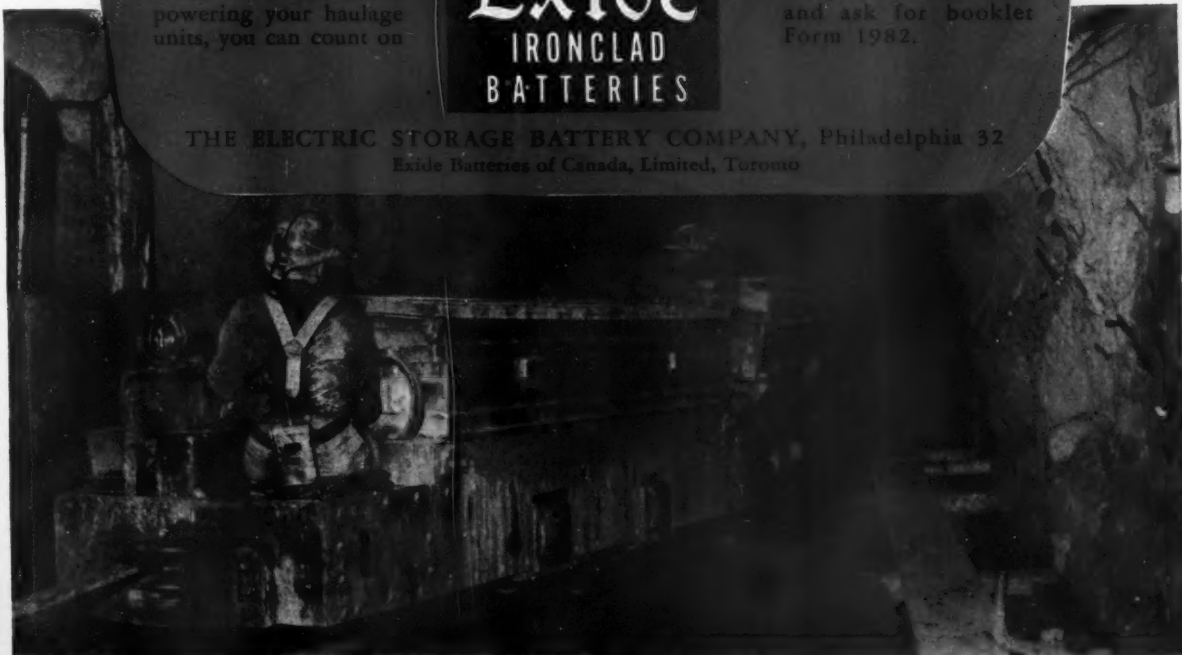
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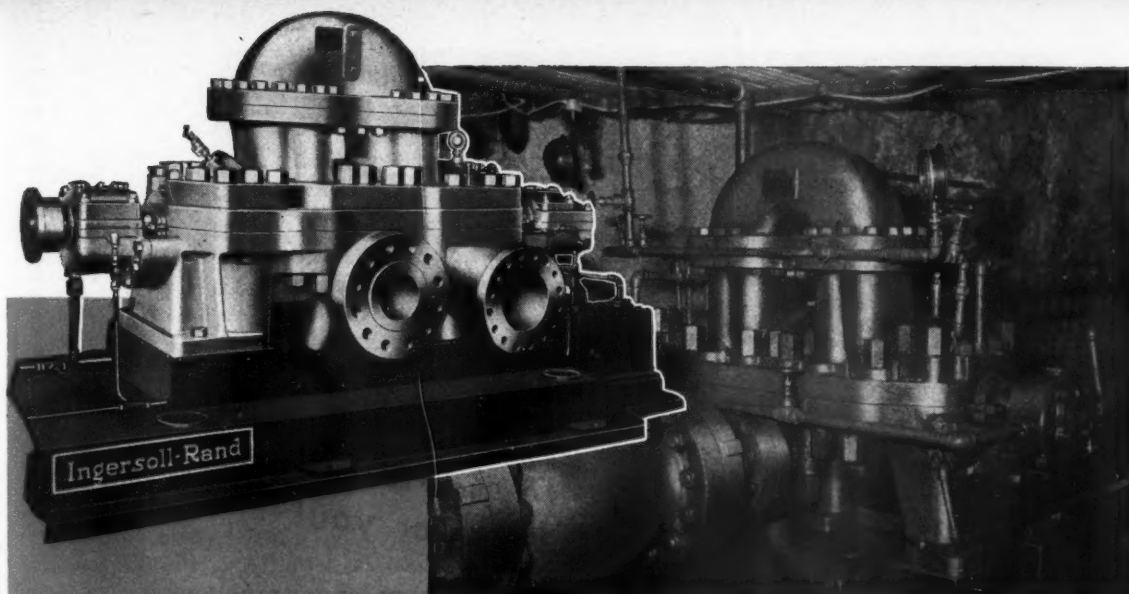


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[Page 20]



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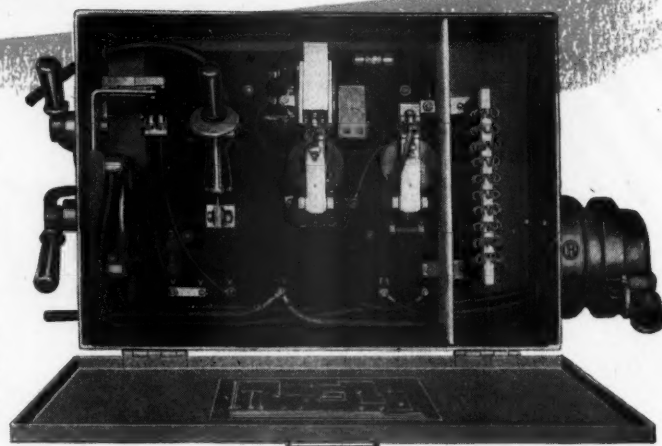
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*Published for the Entire Mining Industry
by The American Mining Congress*

JULIAN W. FEISS, Editor

Volume 32 MARCH, 1946 Number 3

"Have" Versus "Have Not"

WHEREVER mining men gather today, one of the crucial topics debated is the extent to which the United States is a "have" or "have not" Nation. At professional meetings, over the dinner table, at informal smokers, in editorial columns of technical journals, and in the casual conversations of mining men, this subject has become one of the most universally discussed throughout the country.

The mining industry and its allied professions have been involved in this argument before. As some individuals are "bullish" by nature, and others "bearish," and as, in a mining group of any consequence, both shades of opinions may be expressed, confusion results in the mind of the impartial observer.

Much discussion has centered around Elmer W. Pehrson's paper as presented before the American Institute of Mining and Metallurgical Engineers at its February, 1945, meeting. Prior to that, William L. Batt and others had given the public the impression that our mineral resources were on the wane. Furthermore, some of Mr. Pehrson's figures were taken too literally. The uninformed have ignored the potentialities of future development and the past record of the mineral industry in constantly replacing worked-out reserves. The nature of mining enterprise runs contrary to other business concepts because to develop ore reserves, one must mine. Mr. Pehrson's figures, after all, were merely estimates based on reserves known to exist or inferred from good geological evidence; they have been shown to be erroneous as regards quicksilver, and one would be bold indeed in not questioning his figures on certain other metals. His paper and subsequent articles have been valuable in focusing public attention upon the vital importance of our mineral resources, but they have left an oversimplified, a distorted picture in the mind of the ordinary reader.

It is axiomatic that mineral taken from the ground can not be replenished as is the case with agricultural products; on this there is no argument. How-

ever, we by no means know what the actual ore reserves are in most of our existing deposits. Many a mining engineer who has rashly predicted exhaustion of a specific property has been obliged to "eat his words," often many years after the date set for the event. Mines are made, not born, and new reserves are developed. Mining requires venturesome capital, ability and initiative. One has but to review the history of an operation such as the United Verde Extension to realize how important these factors can be.

If American enterprise were sterile and lacking in imagination, one might be pessimistic as regards the future. Fortunately this is not the case, and fortunately the resources of the United States present a challenge to all interested in mining enterprise, provided the incentive exists for mining capital to explore and develop the resources available. There is no reason to suppose that great ore deposits stop at the margins of valley fill in the Basin Range province of our Western States. There is no reason to believe ore deposition has stopped at points where the water table has made mining difficult in such localities as Leadville and Cripple Creek. There is no reason why geophysical means in future years will not discover new ore deposits of which we have no inkling at the present. There is no reason to believe that the lower limit of shaft mining has been reached in many of our present operating mining districts. There is no reason to believe that improved methods of recovery will not result in extensive use of lower grade ores. The MINING CONGRESS JOURNAL believes that the individual engaged in mining in the United States is resourceful, able, and intelligent and finally, that he is not easily licked by fear or equally important, by technical difficulties.

Coal and Public Relations

CONCERTED efforts have been undertaken to present to the public the story of coal. Besides advertising in widely circulated national magazines, several interesting booklets have been published recently on this subject and, assuming a wide distribution, the results should be beneficial to the industry. One publication stresses coal's contribution to the effort as well as its significance to the nation in terms of industrial wealth. Emphasis is also placed on the reliability of coal for heating and its economy for power generation. The moving picture "Power Unlimited" which was released in 1945 is an example of the type of publicity that is needed. This gave a stirring portrayal of the industry from the working places in the mine to the ultimate use of coal. Publicity of this type can do a great deal to place the coal industry on a solid footing with the public.



Improved bottom dump skip as used at Rarus mine

A Bottom Dump Skip at Butte

This New Skip as Used at Butte Has Proved Both Practical and Economic as a Time and Labor Saver

By W. R. CATROW

Anaconda Copper Mining Company

THE (so-called) bottom dumping skip has been in use at the Butte mines since 1939 for the transferring of waste underground. Actually the term "bottom dump skip" is erroneous because the outlet door is at the bottom of the front side, rather than in the bottom of the skip.

In 1941 an adaptation of the bottom dumping waste transfer skip was installed at the Emma mine for hoisting manganese ore to the surface. The Emma installation proved so successful that a decision was made to replace the Kimberly skips, which have been in general use at Butte, with this new type of skip. This change-over has been made at the Rarus and Belmont shafts and further conversion will take place when materials become available, and as time allows.

Application at Emma Mine

The Emma mine is located within a short distance of the main business district of Butte, Montana. It is surrounded by residences and lesser business establishments and has been operated by Anaconda for many years under a long term lease from the

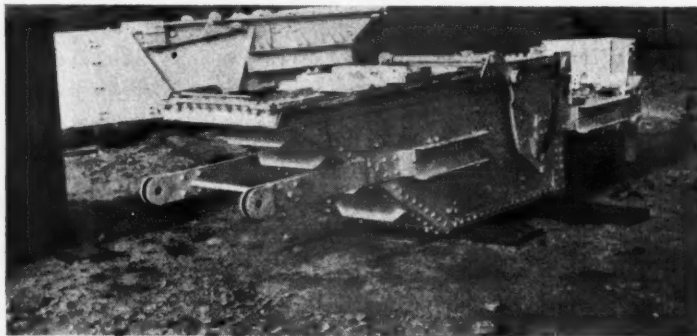
Butte Copper & Zinc Company. Up until recent years the amount of manganese ore mined at the Emma mine was comparatively small and part of this ore was sold for production of ferro-manganese. Certain quantities found use in the chemical industry, and a sinter product was made in a Butte plant operated by the Anaconda Copper Mining Company. Only the highest grade man-

ganese ore was mined and most of the mine's output was zinc ore.

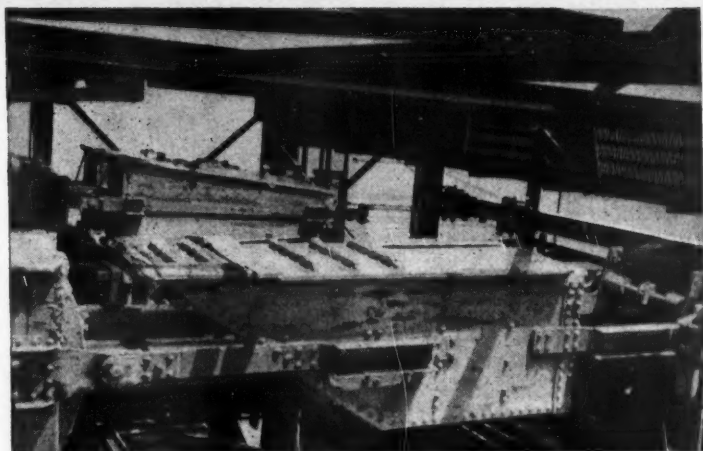
After World War II created a large demand for domestic manganese, the Emma mine became a major producer and a new plant was built at the Anaconda Reduction Works for treating the carbonate ores from this mine.

When manganese production was planned, existing hoisting and ore handling facilities were inadequate for the projected output of ore. At this time ore was caged on the various level and small cars were hoisted to the surface by two deck cages. The average daily hoist with this method was about 525 tons and it was desired to hoist over 1,000 tons per day.

The mine yard is small and as has been stated is surrounded by privately owned property. The hoist is an old steam hoist of low capacity and the head frame is a wooden structure only



Original skip type used at Rarus mine



Emma mine, bottom dump skip

70 ft. in height. It would have been a very expensive undertaking to install equipment similar to that used at the larger mines in Butte as a new head frame would have been necessary, the present one lacking height for Kimberly skips. Furthermore the existing hoist probably would not meet requirements under these conditions and more ground would have to be acquired for the plant; the latter in itself being a large expense in this location. Also it was not known how long there would be a market for domestic manganese; so a considerable financial risk would be taken if such a plant were built.

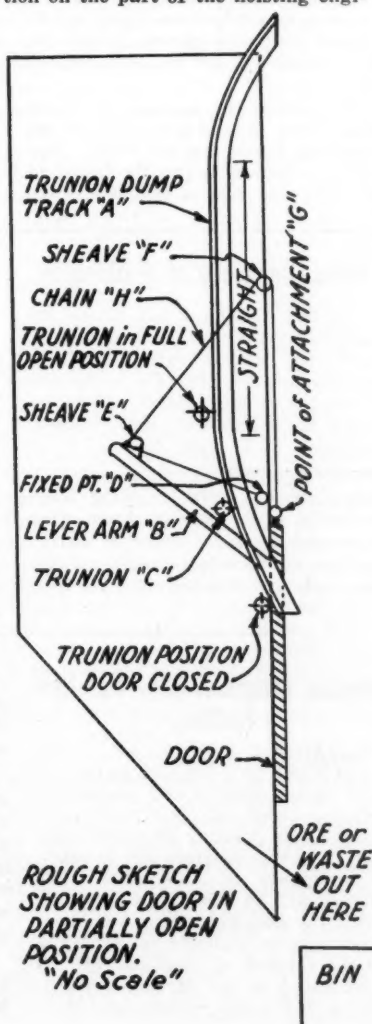
Bottom Dump Skip Was Obvious Choice

The bottom dumping waste skips had been successful, so it was decided to adapt it for hoisting ore under the existing plant conditions and this proved to be a wise choice.

The ore handling system is as follows: Ore is handled on the production levels in Granby cars and these dump into ore passes, which are located close to the shaft, and extend from the 400 level to the 1,300 level. Ore pockets are located on the 900, 1,100, 1,300 and 1,500 levels. These shaft ore pockets have auxiliary measuring pockets, which have a capacity of one skip load. Formerly two men were required for loading the skips. One of these remained at the shaft ore pocket operating the air cylinder chute doors to load the measuring pockets. The other man operated the air cylinder measuring pocket doors. (Both of these operations are now done by one man). The skip dumps into a small hopper at the shaft collar and an inclined belt system carries the ore from the hopper to the ore bin.

The first bottom dumping skips were manually controlled in the same manner as the bottom dumping waste

skips but the skip now used is dumped automatically. This has been an improvement since it requires less operation on the part of the hoisting engi-



neer, makes dumping slightly faster, and eliminates the expense of the dump operator required by the manual dumping type of bottom dump skip.

The automatic bottom skip is emptied by a lever, chain and sheave system, on each side of the skip, which raises the door, located in the bottom portion of the front side of the skip. As the skip is hoisted to the start of the dumping position a trunion wheel "C" on the lever arm "B" engages the dumping track "A". The lever arm is pushed by the trunion wheel acting on the curved track. One end of the chain "H" is fixed to the skip frame (Pt. "D"). It runs through a sheave "E" on the lever arm to a sheave "F" at the corner of the front and side of the skip, through sheave "F" to point of attachments "G" on the door. As the lever is moved toward the back of the skip it pulls the door up. The trunion wheel has to travel along the dumping track approximately 6 ft. before the door is completely open.

A straight section is provided on the dump track to provide for "over-pull" by engineer. This maintains door in open position. A curved section extends beyond the straight section of dump track. This allows door to close in case of a long "over-pull." The rock runs from the skip sufficiently fast to throw it all in the hopper. No muck is spilled down the shaft, and no apron is necessary to prevent this.

This installation has been an outstanding success at the Emma mine. Daily hoists up to 1,350 tons have been easily handled and much larger daily hoists would be possible if the plant hoist would stand up under this increase. Unfortunately the boiler capacity is too small to maintain operating pressure when the hoist is used in fast and continuous service.

Advantages of the Automatic Bottom Dump Skip

The greatest advantage of the automatic bottom dump skip is that it is entirely self cleansing.

In contrast, the Kimberly skip which dumps through its top must be cleaned frequently to give satisfactory performance. This is especially noticeable in long skips of small cross section as required by small dimension of Butte shafts. In addition, heavy loading causes increased packing.

With the automatic bottom dump skip loading by use of measuring pockets achieves its maximum efficiency and overflow muck is cut to a minimum by the constant capacity of this skip. The only real source of overflow occurs when the main ore bin gate gets out of control and such instances are rare. Advantages of this system can be listed as follows:

1. Loading and dumping is faster than with the Kimberly skip.

2. Timbers and other obstructions are more easily removed from this skip than from the Kimberly skip.

3. There is no spill in unloading the bottom dump skip. Kimberly skips cannot be loaded to their top because the dumping action sometimes throws rocks from a too high load beyond the ore bin; this being a hazard to personnel in the vicinity of the shaft. Bottom dump skips can be fully loaded without incurring this danger.

4. As illustrated by the Emma plant the bottom dump skip can be used with a low head frame. In the case of a new hoisting installation this shorter head frame requirement would mean not only a saving in money but also in space requirements for the complete hoisting plant.

5. A bottom dump skip has a higher tons per skip factor than a Kimberly skip of the same size. Also this skip factor is dependably even at all times.

6. The bottom dump skip can be used for transferring waste underground. It will probably find application in transferring waste from the surface to underground waste pass systems. In this event it is visualized that this lowering can be accomplished in balance with ore hoisting.

7. Its self cleaning feature will be valuable when it is used at mines where several types of ores are hoisted, i.e., zinc ores, and several

grades of copper ores. In former practice, in such cases skips had to be cleaned at each change in ores to prevent mixing and dilution.

Replacement of Kimberly Type Skips

After the advantages of the automatic bottom dump skip were proven it was decided to replace the Kimberly skips with the automatic bottom dump skip. The first changeover was at the Rarus shaft through which the ore production from the Tramway mine is hoisted. Results here have been good and the skip factor was increased from 5.2 tons to 6.6 tons by this change.

Automatic bottom dumping skips are being designed to have the same size as the Kimberly skips which they will replace at any particular shaft. The outer shell of these skips is fabricated from steel sheets, which are of a variety classified generally as low carbon, corrosion resistant double strength steels. Linings are made of abrasion resisting steel—carbon 0.35-0.5 per cent, manganese 1.5-2.0 per cent, copper 0.20 per cent min., brinell 200-250.

To cushion the impact of falling rock, strips of rubber are placed between the lining and the shell. This rubber "cushion" backs the lining of the back and bottom completely and



First type of bottom dump skip developed for waste transference

also the front with the exception of the door.

These strips are spaced $\frac{3}{4}$ in. apart to allow the rubber its full resiliency.

Shock pad-strips are in general use in all skips at Butte. The life of these is long. To date none has been replaced.

Prospector's Course at the College of Mines, University of Washington

TO FOSTER the art of prospecting by giving young men training especially designed for the purpose, the 1945 session of the Legislature of Washington, with the approval of Governor Wallgren, authorized the College of Mines of the University of Washington to offer a prospector's course. With the aid of a special fund of \$18,000 the college is offering the course several times during the biennium 1945-1947.

Washington and its neighboring states, together with Western Canada and Alaska, contain numerous rich mines and mining districts, but within this northwest quarter of the continent are large regions known to be mineralized that have not yet been closely examined. Their opening has been hindered by the difficulties of travel through them. The recent construction of highways and airfields, which was hastened by the war, has greatly improved the conditions for prospecting in parts of the area.

The prospector in the Old West traveled widely in his search for gold-quartz ore and gold-bearing gravel. At a later period he was on the lookout for ores of the common metals, especially copper, lead, and zinc. All these substances are still desired, but

in addition a demand has arisen for many others that are less well known. Familiarity with a variety of these ores and minerals gives the prospector of today a greater chance of success than if his search were more limited.

Prospecting can still be done as in the past by a small group of partners assembling an outfit, working independently, and making their own choice of a region in which to search. Another practice is to carry on the field work with the financial aid of a

grubstake provided by backers who are entitled to share in the profits of the venture. To a greater extent than formerly, however, the mining companies are employing competent field men to engage in prospecting, either on salary or on the basis of wages plus a share in whatever finds are made. These men may conduct a wide search or they may be assigned to "intensive prospecting" in a limited field, and their purpose may be either to locate all out-crops having apparent value or to concentrate on a hunt for some particular ore or mineral.

Canadian Longyear, Ltd., Has New Facilities

CANADIAN LONGYEAR, LTD., of North Bay, Ontario, announces plans for the erection of a new manufacturing plant and office building as a part of its postwar expansion program. The new quarters will be ready for occupancy in June, 1946. The building will be located on a site in North Bay acquired over a year ago. Many features designed for efficiency and the comfort of employees will be incorporated in the structure which will be thoroughly modern and fire-

proof. The office portion will comprise 3,400 sq. ft. of floor space. The manufacturing unit will occupy approximately 17,000 sq. ft.

The company manufactures a wide range of diamond core drills, diamond blast hole drills and core drill supplies. Present facilities are inadequate for the volume of business currently enjoyed. The new structure will relieve congestion and also provide space for future expansion.

The company is a subsidiary of E. J. Longyear Company, Minneapolis, Minn.

Safety in Power Distribution For Coal Mines

Stressing the Importance of Grounding and Giving Results of Tests on
Various Types of Returns

By R. G. GEHLSSEN

Electrical Engineer
Mines Equipment Company

IN THE last decade coal mechanization has grown by leaps and bounds and each mechanical installation results in further use of electrical equipment. We all recognize certain hazards in connection with the handling of power underground and we also know that failure to observe certain precautions has resulted in loss of life and property damage from fires of electrical origin. For example, one rather typical incident, bearing directly on the problem of safety for a mine power distribution, occurred recently where a fire started from short circuit in a coil of mining machine cable in a room neck. When the cable started to spark and sputter, the thought flashed through the men's minds that there might be gas; in such a situation men would not be expected to remain and in this case none did. Everyone stampeded; no one pulled the hot nips off the power feeder and by the time the power was cut off, the coal had ignited and a first class conflagration was on. It was necessary to seal the entire mine for several weeks; its reopening cost was approximately \$50,000 in addition to the lost production of coal.

Grounding the Equipment

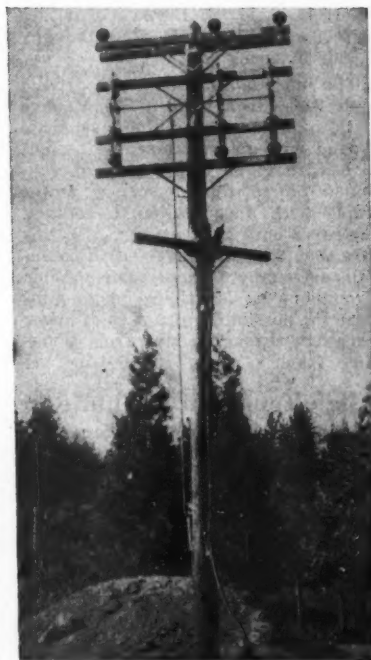
It therefore becomes essential to provide all the safeguards for men and equipment humanly possible to devise and in this connection we come to the important problem of grounding, which, as I understand it, is a hot subject in the art of making machine frames cold.

Grounding is the procedure to maintain a machine frame as near earth potential as possible and it is equally important to bring the frames of the

generating equipment, housing of the source of power, also to earth potential. This means the establishing of a common point of contact with the earth which as a mass is a good conductor of electricity, so at first glance it would appear that a mine would be an easy place to make a solid ground return. However, as you all know, this is far from true; it is possible to hit a strata of earth that in itself is a good insulator or even to contact a stream of water on an insulated strata where the water itself becomes similar to a conductor of high resistance.

Grounding problems are therefore multiple, and no one set of rules can be applied with a magic wand to cover any and all installations. Generally speaking, public utility rules and regulations are somewhat different from underground installations, due to the fact that most utilities are used in a more or less stationary location where fixed grounds of good value can be obtained. The necessary expenditure to provide this safety measure is justified. In underground installation the high mobility of the equipment presents a rather different problem. Fortunately, each item used or intended to be used has specific limitations, so I am going to enumerate a few of the known facts about individual so-called ground connections.

The most common method of grounding is a driven ground rod. First, let us consider its diameter; this is usually set by the mechanical ability of the material to stand driving and fortunately this diameter is attained at about 3/4-in. Exhaustive tests show that further increase in size does little good. A depth of driving beyond eight ft. gives little or no value unless one is inclined to drive rods 30 or more feet deep in order to obtain a point of permanent moisture.



Transmission from surface through bore hole to mine

Spacing of rods is extremely important. Tests show that these should be separated by an amount of at least twice their depth, as 90 per cent of the total resistance is located within an area of 6 to 10 ft. from an electrode. To get lower resistance, multiple rods may be used, properly spaced and inter-connected, since the resistance varies approximately inversely with the number.

Resistance of one rod driven in a mine floor is known to vary considerably, depending on its locality. Top values of numerous tests indicate as much as 1600 ohms, with several tests showing between 30 and 50 ohms and even lower readings are possible; one test made in a stream of water where a rod was driven in crevices of rock bottom gave 11 ohms. This variation indicates strongly that a rod resistance measurement must be taken to determine its reliability.

Well bonded tracks are a good source of contact with the earth. Many measurements have been made showing variations of 1½ to 6 ohms to ground. This may be higher according to localities. Bore holes with grounded casings show from 1 to 4 ohms to ground and well casings are

Paper presented to the New River and Wind-ing Gulf Electrical and Mechanical Institute, December 13, 1945, at Mt. Hope, W. Va.

similar with from 1 to 1½ ohms. Mining machines resting directly on the earth range from 10 to 35 ohms for several tests, numerous others showed from 100 to 300, while some measured 1,000 ohms, depending on the moisture content of the earth and whether or not the machine was sumped. (For all of this data I have referred to U. S. Bureau of Mines tests and an A. I. E. E. article by Claude Jensen.)

The unreliability of local ground connections in a mine no doubt gave birth to the idea of running a separate ground wire to each machine frame; such wire to be terminated, or continued on to the source of power frame with adequate earth contact, like say a bore hole casing. Also this wire should be brought to earth potential as many places as possible throughout its length, so as to minimize the possibility of a path of lower resistance through a man from a machine frame.

High Tension Distribution

The Delta system generally operates ungrounded; should an operator desire to establish a neutral point, it is done by adding so-called grounding transformers. To establish a neutral point at ground potential, it is generally accepted when a Delta system is operated ungrounded, that one ground on a line lead can go undetected for a long time. Then, should a second ground occur on another line lead, the results are generally severe. Should the grounding transformer be used, a neutral point fixed to a ground brings us up to the second way to distribute power. That is, it is similar to a star-connected system.

In a star-connected system, it is generally accepted as good practice to ground the star point. Strip mine power distribution has extensively investigated the proper way to handle the method of grounding. A fourth wire can be used to extend along with the power feeder, which is equivalent to the mine practice of transmitting power by a shielded cable, using the shield or ground wires to return fault current. There are prevalent two trains of thought on limiting the ground current flow in the fourth wire by either an impedance or straight resistance.

Field Tests

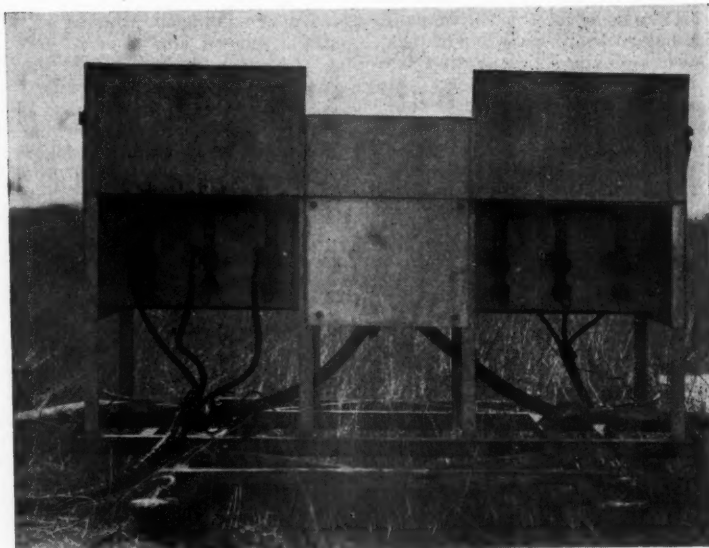
Tests using the earth itself for the return circuit were made on a solidly connected star neutral in a 4160 volt system and the data which I can give you now was personally obtained in southern Illinois during an extended period of dry weather. We became concerned as to how much ground current would flow should a conductor reach the frame of a machine. At a distance of two and one-

half miles a ground rod was driven eight feet deep and connected solidly through a five ampere fuse to a line lead. In the transformer neutral ground, we had a ten to five current transformer hooked to an instantaneous overcurrent relay wired to trip the main breaker. With the application of power, the breaker tripped out before a steady current could be read with a tong test ammeter in the neutral circuit. We then rendered the overcurrent relay inoperative and again applied power. This time the five ampere fuse opened. We then placed a twenty ampere fuse and were able to read twenty amperes. From this test we were positively assured that there was enough current in such unfavorable dry ground to operate an overcurrent relay set at two amperes through a ten to five current transformer.

The same tests were tried at a quarter-mile distance during a period

to show that the strata of the earth has a direct relationship to the current that will flow. The line current transformer ratio was 150/5 and still provided tripping current once when a shovel was moved to a new location 5½ miles away and suffered a damaged cable.

When a neutral of a star system is grounded through an impedance or a resistor, using a fourth wire, the maximum current is completely controlled. One opinion holds that 50 amperes ground current flow is a low enough current to provide full protection; another thought limits the current to 25 amperes. The system of using earth alone for return may let the fault current vary according to the tests just related and no doubt you have at one time or another either tested or wondered what current the earth would permit to be circulated under such conditions; according to the test related, it is twenty amperes



Sectionalizing power cables in strip mining

of extended rain in central western Missouri. It is interesting to note that the maximum current we could get with the ground very wet at one-quarter mile was again twenty amperes. Another test was made in central north Oklahoma with dry conditions prevailing, and again we were close to the twenty amperes ground current flow at two miles distance, it actually being twenty-seven. Still another test was conducted where the overcurrent relay was hooked in the star point of the main line current transformer secondaries before it was attached to the ground point. This deviated in the method of obtaining trip current and through a period of years we constantly noted that current flow during faults was 150 amperes or more. This data is presented

for three widely separated properties and one at 150 amperes.

At present the Bureau of Mines is investigating, with the aid of an oscillograph, the voltage from a shovel frame to ground during a fault with various values of ground current flow. Substituting mine substations for the shovel, the condition would be somewhat similar.

It has generally been thought in certain circles that once a fault is initiated it is too late to save the circuit, so it would be just as well to provide instantaneous tripping of the breaker. The value at which it will trip should be regulated to obtain selective operation for individual oil circuit breaker when a multiple number of branch feeders are taken off of the main line.

Underground Cables

High tension cables in mines usually fall in two types—steel armoured was the most prevalent up to a certain period, although many difficulties have been encountered in maintaining a waterproof repair joint. The advent of rubber, or Neoprene jacketed cables of the "SH" or "G" type, brings to industry the possibility of making repairs with a vulcanizer; this type of repair results in a thoroughly sealed splice, giving a cable jacket as good as the original product.

It is well to note here, that grounding shielded or "G" type cables should be so done that it will not be possible to carry load currents should a parallel path be broken. It has happened when "SH" or "G" type cable was grounded at both ends in parallel to an intended path, that the intended path opened up, resulting in the cable ground wire carrying the load. As you would guess, the result was a

to ground in a 220 volt Delta system was 200 volts; each feeder line to ground measured the same, which means that all feeders were partly grounded by the same amount, yet the resistance of the circuit to ground would not permit enough current to cause trouble. During the investigation, a three-pole knife switch to feeder was opened and again the voltage of the transformer line leads was measured to ground; it then showed eight volts.

Grounding a low voltage Delta system again becomes a problem. In the Milwaukee area, industrial users operate with one corner of the Delta grounded through suitable grounding protective relays. In the St. Louis area the same system is used but not with the same number of adherents to this method. For those who do not want to consider such a scheme, there is also the possibility of using three potential transformers with their pri-

insuring the maximum of safety, providing the ground current is limited and the fourth wire is well made up; then use the fault current to trip the power off.

Perhaps you have gained the impression that I have talked more freely of a.c. systems than the usual 275-volt d.c. In considering the safety angle of power distribution, the problem of keeping machine frames at earth potential is quite similar in either a.c. or d.c. To go into the details of power distribution for every type of mining for both d.c. and a.c. would require a volume of material; consequently, I have purposely stayed closer to the fundamentals of reducing frames to ground potential and using the fault current to trip off the source of power.

Power for Face Machines

Distribution of power to the face from the feeder is one of the most neglected phases to come to my knowledge. As is well known, the usual procedure is to use hot nips with some form of fusing or no fuse at all and each of us knows what generally happens to fuses when they blow out and qualified supervision is not readily on the spot to see that they are not replaced by a piece of trolley wire or higher rated fuses.

The mining industry is most fortunate in now being able to secure power distribution boxes with automatic De-ion circuit breakers for the protection of each individual machine. These are entirely adequate either on a.c. or d.c. to rupture short circuit currents from 5,000 to 25,000 amperes, depending on the frame size of the breaker and as a guarantee of performance, they have been tested and approved by Underwriters' Laboratories. The breakers can have instantaneous trips set just over the normal instantaneous peaks of any individual circuit which means that every piece of equipment can have its own protection. However, it is not intended that they in any way be used for thermal overload applications, the prime purpose is to let the machine control itself in performing this function. The real safety angle of applying breakers is the fact that when an individual cable receives an injury and produces a short circuit, the power will be instantly removed, thus preventing a single mining machine cable failure from further disrupting the power system. By "instantly" is meant from one-half to two cycles of time, using 60 cycles as a base. This equipment is fabricated into units of 1, 2 or 3 breakers in a compartment with connectors providing good joints; by having solidly made connections all the way through, a better voltage is delivered to the machines, giving better performance, and providing greater safety.



Distribution box for cables to face machines is a safety feature

ruined cable. Therefore this type of cable should be grounded at one end only.

Low Tension A. C. Distribution

In A. C. we have the usual Delta and star connections. Usually someone asks, "How much voltage should I have, or do I have, and why do I have a voltage to ground?" The value of voltage to ground in a Delta system is determined by the condition of the insulation of the transformer windings and its extension feeders. To further bear this out, I can cite when a miner was killed by touching one line of a 220-volt underground Delta connected power feeder placing him from line to ground. Upon tests it was shown that the actual voltage

maries connected in wye, having the neutral grounded. The secondaries of potential transformers are then hooked in Delta through a voltage relay wired to energize a signal circuit to call attention to a ground coming on one line lead.

It is becoming more frequent for utilities to advance the theory of secondary star-connected four-wire systems because of the ease of metering the power flow, providing the higher voltage for industrial motors and securing lighting to the fourth wire. Manufacturers are more and more providing 208-volt, three-phase motors for this scheme of operation. As is well recognized, the star connected or Delta system, with grounding transformers carrying the fourth wire, is a means of attaining a good method of

A New Idea in Drill Boosters

The Use of a Light Weight Drill Booster Has Greatly Facilitated Roof
Drilling on an Underground Bauxite Property

By JULIAN A. FULLER

School of Mines and Metallurgy
Rolla, Mo.

AT A mine near Bauxite, Saline County, Arkansas, the Crouch Mining Company, Inc., operates one of the deepest bauxite mines in the Arkansas district. The broadly flat-lying, but undulating ore body occurs approximately 300 feet below the surface and is overlain by the sedimentary rocks of the Wilcox (Eocene) formation comprising beds of sand, clay, and lignite. The underlying material is the Midway (Lower Eocene) formation of clay and limestone.

The exceptionally high grade ore body, which averages 55 to 62 per cent Al_2O_3 , varies considerably both in thickness and physical characteristics. The deposit ranges in thickness from 5 to 22 ft. and averages 13 ft. The physical characteristics of the ore may be classified into three types, namely: the dry uncemented pisolitic ore, the soft yellowish claylike ore, and the hard brittle variety.

Method of Prospecting

Prospecting of the ore body was accomplished by using hand rotated churn drills with the power to lift the drill stem supplied by a take-off from a truck. The take-off consisted of a 1-in. rope tied to the T-piece at the top of the drill stem and passed over a tripod-supported sheave to a drum attached to the rear axle of the truck. By tightening and loosening the free end of the rope, the drill stem was lifted and dropped, respectively. When the bauxite zone was approached during the drilling operation, the cuttings, which were brought to the surface by the circulating water, were watched meticulously for the presence of the ore material. Upon the appearance of bauxite in the cuttings the drill stem was removed and the hole was cased and sampled.

The hole was cased by lowering a 1½-in. pipe to the top of the bauxite and hammering it approximately 2 or 3 in. into the orebody to form a water tight seal. Drilling then proceeded and 4-ft. sample runs were cut consecutively through the ore zone with a ball valved fish-tail bit.

Mine Layout and Operation

Access to the Crouch Mine is by means of a 72-in. diameter steel shaft. The steel is ½ in. thick. An auxiliary steel shaft of 36-in. diameter is used both for ventilation and as a manway. The mine was developed laterally on a 45 to 50 ft. square-center basis. The drifts and crosscuts, driven on a predetermined grade as controlled by the undulations of the ore body, are 11 to 12 ft. wide and 6 to 8 ft. high leaving pillar blocks 33 to 39 ft. on a side.

Mining operations are then conducted by a retreating method and are begun by completely splitting the pillars adjacent to the boundary, on from two or four sides. This results in four small pillars (or stubs) at the

corners of the original one (see Figure 1). The bauxite is loaded into 30 by 36 in. cans by hand shoveling.

The general mining practice is to drive near the bottom of the ore deposit by leaving approximately 6 in. as a mat. The mat forms a protective layer of bauxite, thus allaying contamination of the ore by the underlying clay, and giving stable haulage and drainage footing. As the drifts are normally 7 ft. high and the ore body ranges up to as much as 22 ft. in some places, ore as thick as 12 to 13 ft. is frequently left in the roof. In areas where ore is thus left unmined it is taken down by overhand stoping. This is done by a slabbing or inverted benching method where holes 4 to 5 ft. deep are drilled and blasted successively. (See Figure 2.) It has been found beneficial to leave at least 1 ft. of bauxite in the roof to protect the miners against the very unstable

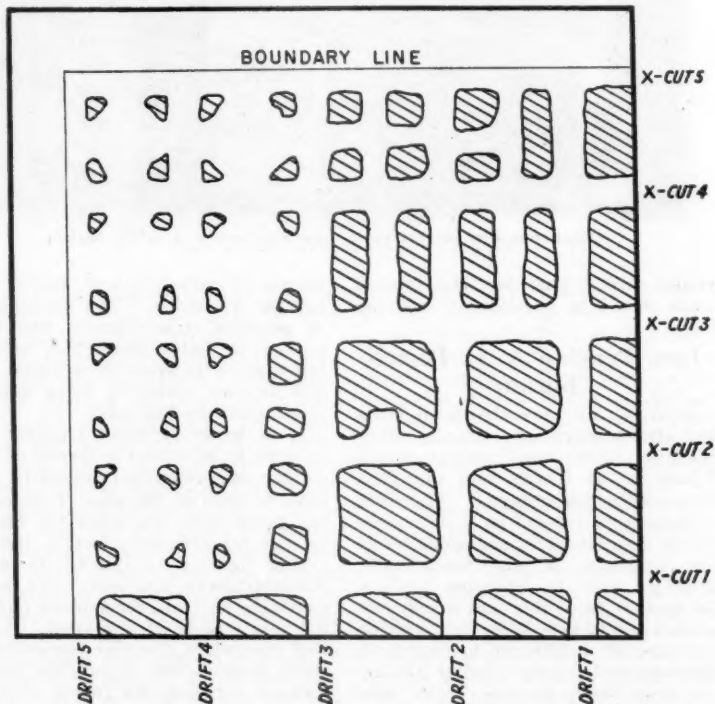


Fig. 1. Method of splitting pillars

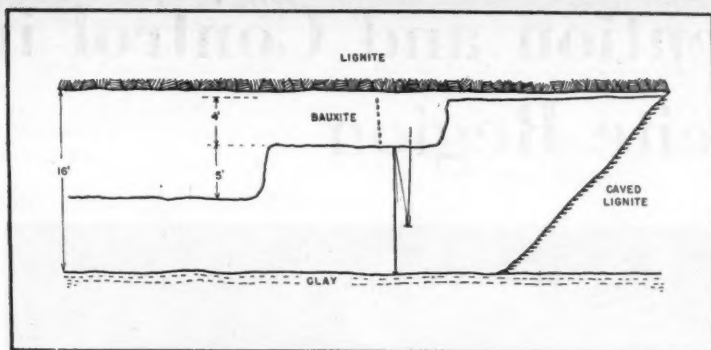


Fig. 2. Overhand stoping method

lignite which overlays the whole deposit.

Overhead Drilling Presented Difficulties

Both the drifts and the cross-cuts were driven by using auger steel in jackhammers weighing 45 pounds. However, the task of drilling overhead in very hard and brittle ore without some booster device to support the drill proved to be not only very laborious but also very inefficient. Frequently it required 30 minutes or more for two men to drill a $4\frac{1}{2}$ to $5\frac{1}{2}$ ft. hole. This rate of drilling is markedly slower than that consumed in drilling other varieties of bauxite. In addition to the slow drilling rate and because of the tiring and laborious nature of drilling the roof by holding a jackhammer in an overhead position, only a few holes were drilled at widely spaced intervals. Consequently, large slabs and/or boulders were blasted down which caused abnormal wear in the 20-ton-per-hour hammermill in the tipple. Moreover, boulders or slabs that were too large for men to handle had to be broken either by blasting or by using stone hammers. This laborious work resulted not only in a low tonnage per man but also in a high powder cost per ton and unnecessary secondary blasting.

The Use of a Booster

The desire and necessity for a device which would facilitate the roof drilling led to the design and development of the drill booster. The booster, to be effective, had to fulfill the following four requirements:

1. It had to be light in weight and maneuverable so that one man could easily carry it.
2. It had to be of such design as to enable more than one hole to be drilled with one set-up.
3. It had to be rigid as it would have to support the weight of the jackhammer in operation.

4. It had to be capable of accommodating roofs varying in heights from 8 to 15 ft.

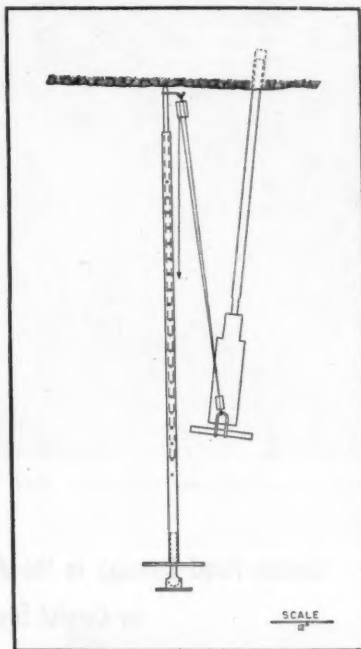


Fig. 3. Drill booster in drilling position

The drill booster developed to meet the above requirements was made in the mine shop and was the product obtained individually from the miners' suggestions. It consists of a base plate with a ball and socket screw-jack 7 ft. of $1\frac{1}{2}$ in. diameter pipe, 6 ft. of 1 in. diameter pipe, a double pulley block, a single pulley block, and approximately a 20 ft. length of $\frac{1}{2}$ -in. rope.

A sharp point was welded on the top of the 1-in. pipe to enable the booster to be securely held in the roof. The $1\frac{1}{2}$ -in. pipe, which contains holes drilled completely through every 6 in., rests on the adjustable ball socketed screw-jack. The 1-in. pipe is

inserted into the $1\frac{1}{2}$ -in. pipe and is held in any position within 6 in. by a bolt placed through the holes of the larger pipe. A hook was welded to the top of the 1-in. pipe to hold the double block pulley and another hook, which holds the jackhammer handle, was attached to the single pulley block. The $\frac{1}{2}$ -in. rope connects the two blocks. The total weight of the drill booster is 42 pounds. (See diagram III.)

After the area to be drilled has been selected, the booster is erected simply by placing the base-plate on firm ground, the final adjusting handle of the screw-jack being as near the base-plate as possible, and the smaller 1-in. pipe extended and secured by the bolt as high as the roof will permit. The adjusting handle of the jack is screwed up until the whole device is rigidly held between roof and floor. The jackhammer and auger steel, supported by the hook, are then raised by pulling the free end of the rope until the 6 or 8 ft. auger steel is in position for drilling. An auxiliary 1-in. pipe 10 ft. long may be used for roof heights over 11 ft.

Results

During the advancement of the steel through the ore, the weight and vibration of the jackhammer, which is transmitted to the loose end of the rope, is reduced by a factor of three.

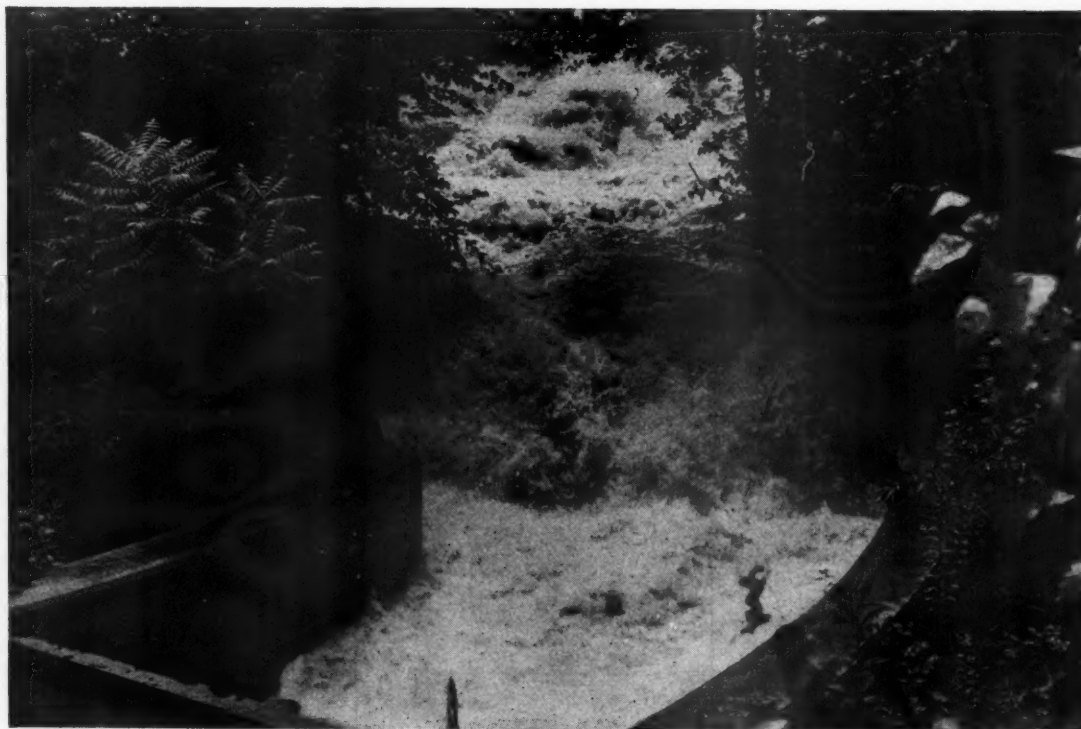
The average time spent in drilling a $4\frac{1}{2}$ - $5\frac{1}{2}$ ft. hole with the aid of the booster is reduced from 30 to 10 minutes. This is a saving of approximately 66 per cent of the time required to drill each hole by the old method. The average time taken to make a complete set-up is 4 minutes and at least two holes can be drilled with one set-up. The device can be applied satisfactorily for drilling roof heights as great as 15 ft. The cost of the booster is negligible as it ordinarily is assembled from scrap material.

It may be stated in summary that, although the drill booster comprises additional equipment to transport and some time to erect, the general result is, that its development has not only facilitated the drilling of roof holes, but also it has produced an increase in tonnage with a corresponding decrease in the powder cost per ton. Also it may be gathered from these results that the four basic requirements have been satisfactorily fulfilled. The miners have a common pride in "their booster" and this has helped considerably to bring about a more harmoniously working group.

Acknowledgment

The author wishes to thank Dr. J. D. Forrester, chairman, Department of Mining Engineering, School of Mines and Metallurgy, Rolla, Mo., for his aid in preparing this material.

Flood Prevention and Control in The Anthracite Region



Flash-flood water entering concrete intake of a 90-in. diameter flume

A MINE disaster probably attracts the attention of the public to a greater degree than a disaster of similar proportions in any other industry. When a disaster occurs, such as a mine fire or an explosion, persons that happen to be underground often have means whereby they may be saved some time after the accident; however, when a mine is inundated by a sudden inrush of water or water-laden materials, hope of rescue is gone for those victims in the affected part of the mine. A flood in mine workings is a crisis, even if no lives are lost, and when the crisis is past and the excitement wanes, there is a rapid return to unwarranted complacency in those regions where floods occur, even though the imminent danger of recurrence is known.

Experience in flood control, regardless of its nature, has taught us that in a flood the work does not cease

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Serious Flood Damage in the Anthracite Region Can be Controlled by Careful Engineering Planning

By S. H. ASH

Chief, Safety Division
Health and Safety Branch
U. S. Bureau of Mines

when the emergency passes; rather it increases as the water recedes. To do nothing, when we know that a hazard exists, is inexcusable for those that should do something. To prevent floods in mines we must collect data and do something constructive with those data, not alone for present conditions, but for the future.

The anthracite mines of Pennsylvania are threatened by floods that will be far-reaching in destruction if something is not done without too much delay. If there is failure to protect against floods, it is not entirely a

matter of losing one mine, and possibly the lives of the men that work in it, by inundation, but a threat often exists to several mines. In the floodless years work must be accomplished to protect life, property, and anthracite reserves from the floods that will certainly occur in the future, whether they are caused either by surface waters, or water-laden strata, or large bodies of water that are impounded in abandoned mine workings. It is beyond the financial ability of the anthracite industry to remedy this condition without Government assistance.

The subject of flood prevention and control in the anthracite region has been discussed in many publications; this report discusses the need for action to solve a serious problem, instead of giving a detailed description of the methods being used to handle mine water.

The Anthracite Mine-Flood Problem

The quantity of water that enters anthracite mines through fissures in the strata and in barrier pillars between abandoned mines and active mine workings has increased considerably, as indicated by the ratio of tons of water pumped to tons of anthracite produced underground. The ratio has increased from 8 to 1 in 1920 to 32 to 1 in 1944 at some collieries producing a large tonnage. The depth of mine workings has also increased at these collieries. The mine drainage systems in the anthracite region handle annually over 200 billion gallons of water, of which 150 billion gallons is pumped from underground workings to the surface.

The basin-and-range structure of the coal measures in the anthracite region facilitates the accumulation of water either in the strata or in abandoned mines or in active mine workings. The mountains surrounding the anthracite fields are steep, and the beds dip from the sides of the hills to the valleys below. Strip pits and underground mining operations near surface bodies of water or water-laden strata have created conditions that permit an excessive quantity of water to enter mine workings. Illegal mining of barrier pillars and outcrops has provided free openings for surface water.

As a consequence of the above conditions, rainfall is quickly noticeable in anthracite mine workings. A sudden inflow of water after heavy precipitation often overtakes the capacity of underground pumping plants, flooding parts of active mines and causing loss of production aside from endangering lives and the mine.

Heavy precipitation increases the quantity of water that accumulates in numerous abandoned mines, and, unless drainage facilities are adequate to handle this excess water, the hydrostatic pressure against the barrier pillars is increased. Many of the barrier pillars between underground pools of water and active mine workings are not strong enough to withstand additional hydrostatic pressure beyond a definite figure; consequently either costly stand-by pumping facilities are installed to handle the excess water or the active mines affected are forced to close when the lives of the workmen are jeopardized.

The hydrostatic pressure against barrier pillars in abandoned mines is

maintained, where possible, at a definite figure either by draining the water through boreholes in barrier pillars or by pumping the water by direct means.

Infiltration of Surface Water Into Mines

Surface water that enters underground workings can be attributed to (1) main- and side-stream leakage, (2) general surface leakage, and (3) barrier-pillar seepage.

Stream leakage is the most important source of surface water in several anthracite-mining districts. Potential danger zones in the anthracite region are the areas where rivers and creeks overlie the coal measures and where so-called buried valleys or old river or stream channels exist. These channels present a hazard that needs

attention at all times because what can happen is unpredictable and the danger zone is not visible. The companies that operate mines in these places must spend large sums of money to drill numerous boreholes to establish definitely and accurately the course and extent of the water-laden materials, so that a safe rock cover can be maintained between the mine workings and the water-laden materials. Subsidence of mine workings in such places can cause serious consequences.

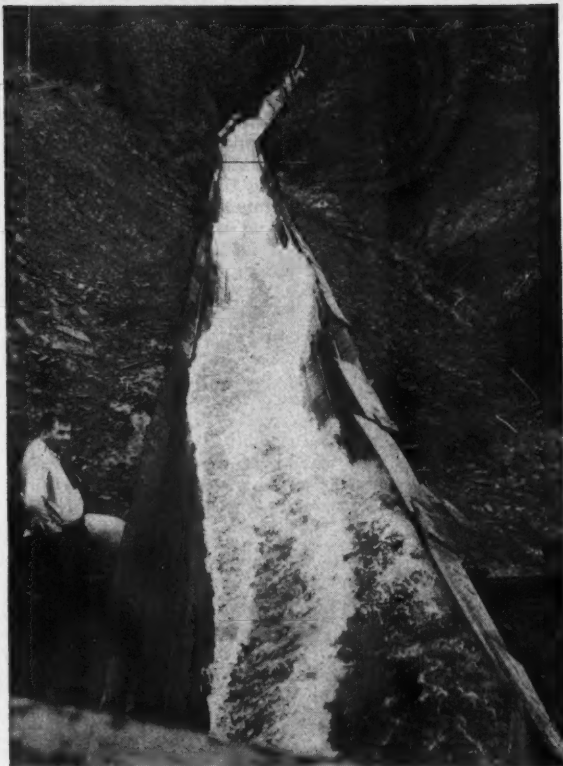
Rock fissures, cave-ins, fissures in outcrops, and strippings, either on the flood plains of streams or on drainage areas, provide easy ingress to much of the surface water and create a serious mine-water problem in the anthracite region. Many of the fissures and cave-ins are not visible on the surface because they either are hidden under refuse banks or are partly



View of town in the anthracite region during flood of 1940



View of town in the anthracite region during flood of 1936



View of V-shaped flume (during flash flood) with sideboards to prevent overflow

filled with dirt; these openings contribute much to water seepage. Intensive bank operations during the war have exposed many of these fissures to surface waters.

Often active mine workings are connected to abandoned mine workings or have barrier pillars that permit water to seep through them. More than 69 billion gallons of water are impounded in underground pools in anthracite mines. As part of the investigation of the anthracite mine-water problem, the Bureau of Mines has collected information on underground pools in the different fields. This information shows that 26 underground pools having an estimated water content of 12 billion gallons are present in the Northern field; 31 pools having an estimated water content of 32 billion gallons, in the Southern field; and 25 pools having an estimated water content of 25 billion gallons, in the Western Middle field.

The re-mining of beds in the anthracite region is as active today as it was 35 years ago. As a result, "squeezes" are common, the weakening of pillars is inevitable, and rapid subsidence in unexpected places occurs. Under such conditions no assurance exists that pillars (barrier or otherwise) can or will serve the purpose for which they were intended originally. Millions of dollars are or should be expended in backfilling, reinforcing

In consequence of mining operations during the life of the anthracite industry there have been numerous and serious caves or subsidences of the surface and strata overlying mine workings that have caused damage to surface property, loss of life, and loss of parts of mines by inundation of mine workings.

The process of mining is inevitably followed by some degree of sinking of the overlying strata and consequently of the surface. It is true, regardless of the nature of the underground excavation and the method of roof support, that subsidence of the ground above the excavation is the final incident in mining. Furthermore, where water or water-laden materials are present, the question of subsidence assumes, for underwater workings, an importance transcending that of perhaps any other circumstances concerning subsidence.

Flood-Prevention Projects

A flood-prevention project contemplates action by which the danger from inundation is removed. Every project consists of a definite cycle of operations developed from ideas that are crystallized and translated into an action program through various engineering phases that begin with the first preliminary survey and do not end until the project either is re-

jected or is completed. Where projects are to be conducted by Federal funds, an authorization must be obtained through definite channels in the Federal Government to conduct a preliminary investigation to determine whether or not Federal funds to conduct construction work is justifiable. A preliminary survey on the prevention of flooding of anthracite mines has not been authorized.

The prevention of floods that would cause a loss of anthracite production was important to the war program. Furthermore, both during the war and now, every shut-down, from whatever cause, deprives the northeastern section of the United States of anthracite that is needed badly. Failure to prevent inundation of anthracite mines halts production, endangers the lives of workmen, damages (sometimes beyond repair) vital underground equipment, and threatens the permanent loss of a large portion of the anthracite reserves of the nation.

Funds in a very limited sum were made available to the Department of the Interior, Bureau of Mines, for the fiscal year ended June 30, 1945, for anthracite investigations, one of which was to conduct inquiries and scientific and technologic investigations that have a bearing on the anthracite mine-flood problem where it appeared that construction work on some small projects of immediate consequence would be helpful. Small projects were chosen that could be completed within one year, in cooperation with the industry, and thus prevent the loss of production at a critical time. It was believed that such projects would lessen the chance that flood water would inundate mine workings. A smaller sum was allocated for the fiscal year beginning July 1, 1946.

The outstanding fact developed by the work that has been done shows that before any money is expended by the Federal Government on an anthracite flood-prevention project situated on abandoned mining property, the continued maintenance and protection of the construction works should be assured; furthermore, an engineering study of the mine-water problem should be commenced as soon as possible, provided this study leads to an action program that has proper safeguards for the maintenance and protection of the construction works that may be built.

Because the anthracite industry is unable financially to conduct projects that will cost nearly 100 million dollars and because the threat of inundation of anthracite mines and anthracite reserves is the chief factor that threatens both to cut short the life of the anthracite industry and to curtail production, an engineering study of the flood-prevention problem

(Continued on page 46)

Mercury Meanderings—Part II

IN the October, 1945, issue of this magazine there was an expert article entitled "Quicksilver Quandary." In it Special Contributor (come out from behind that typewriter, Sam Williston!) referred to new uses of the metal in the "bright new world" ahead. There is no question that there are new uses, many of them developed during the war, which have changed the outlook considerably.

A correlation can be made of statistics of past uses of quicksilver, as a help toward making predictions for the future. A table can be set up as follows:

Classification	Percentage of Total Use Between		
	1918	Wars	1944
Drugs and chemicals	33.7	45.0	29.7
Instruments, including electrical & chemical apparatus	9.3	20.0	36.7
Fulminate	33.8	10.0	4.4

These figures add up to about three-quarters of total consumption. They point up the relative increase of use in instruments and apparatus, and the relative decline in fulminate. It would be nice to have a fourth column, a "Post World War II" column,

A Leading Authority on Mercury Indicates a Future for the Metal During the Post-War Era—With Certain Reservations

By WORTHEN BRADLEY

President
Bradley Mining Co.

in which it might be forecast that drugs would stabilize at say 40 per cent; instruments at 33 per cent; and so on. But the advent of the mercury battery renders futile any such predated reasoning. It is useless to attempt prophecy when so little is known of what may well become the determining factor in the quicksilver industry.

The Mercury Battery

In fact, all I know of the mercury battery is what I read in advertisements and publicity releases. P. R. Mallory and Co., Inc., of Indianapolis, are the manufacturers and have drawn attention with full page announcements in several national magazines. They claim that the "Tropical Dry Battery," as they call their prod-

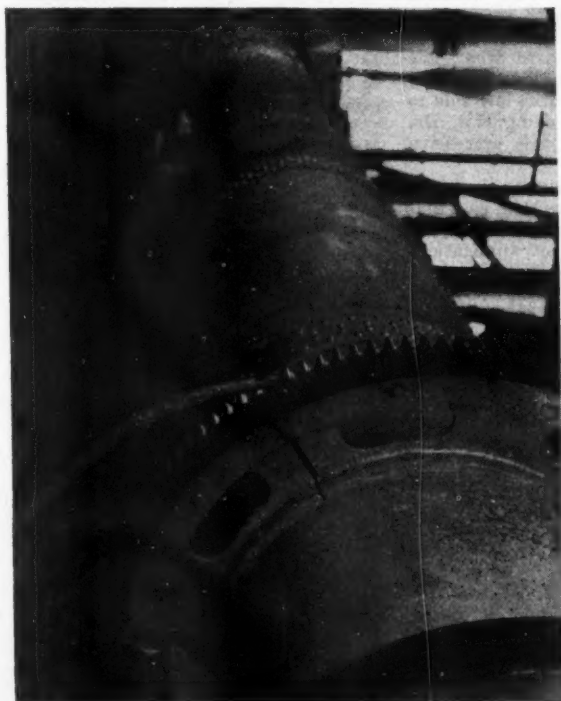
ucts, "gives four to six times the life of the conventional battery it replaces. It withstands high temperatures and humidity . . . gives greater power with smaller size . . . its voltage remains substantially constant throughout its operating life . . . needs no 'rest periods,' possessing the same ampere hours' service-life whether operated intermittently or continuously . . .

"It seems certain that, when civilian models are available . . . (the above qualities) will be embodied in hearing aid batteries . . . The pocket radio (also) comes closer . . ."

One of the more recent Mallory ads headlines the intriguing question: "How Long A Step from Handie-Talkie to Hearing Aid?" The answer seems to be contained in two items—one an article, the other an ad—in recent news sheets. The *Wall Street Journal* of January 26, 1946 states that the manufacture of mercury batteries for civilian use is now under way. This is substantiated by an announcement by "Maico of San Francisco" in the *San Francisco Examiner* of February 10. Maico says: "To the hard of hearing . . . Now! In civilian service for the first time, the tiny 'Mercury' Cell makes possible the power packed 'Atomeer' . . ." Two photographic illustrations accompany the ad. One shows what looks like a sawed-off flashlight battery poised between a thumb and forefinger. This is "The 'Mercury' Cell (full size). Less than 1 in. in diameter and only $\frac{3}{8}$ in. high! The heroic 'Mercury' Cell helped power the war famous 'walkie-talkie' . . . from El Alamein to Tokyo . . ." The other photo is of a hearing aid assembly (hearing aid case, wire, and ear plug). The caption says: "This is all you wear. Weighs as little as six ounces. Believed the world's smallest and lightest single-unit hearing instrument combining full 30 volts 'B' battery power and five octave sound frequency range." In the "old" type of hearing aid there is an extra case for the battery; in this new type hearing aid and battery are in the one case.

Pocket Radio

According to *The Wall Street Journal* article, Maico is a Minneapolis firm. The article further states that Chicago radio manufacturers are considering adaptation of the mercury battery to the "new pocket-type . . . sets . . . coming on the market some



Rotary Mercury
kiln at Reed mine

months hence" (Page Diet Smith.) Discussing the Mallory cell, the article describes it as operating "through the chemical reaction of zinc and mercuric oxide. Ordinary commercial dry cells use zinc and carbon . . .

"Despite all apparent advantages the new cells will not replace the common flashlight battery, as P. R. Mallory . . . has repeatedly warned stockholders . . ." At this point the question naturally arises, why not? Is it simply a matter of price, or can there be collusion among flashlight manufacturers?

The article goes on to say that the Mallory company hopes that the mercury battery will eventually capture 10 to 15 per cent of the dry cell business (To realize this it would be necessary to import a few thousand flasks per month). "Future production . . . will come from a new Mallory plant in North Tarrytown, N. Y. . .," starting about April 1. "Also the British government . . . is building a plant in Belfast, Ireland, to be operated by P. R. Mallory Ltd. for the production of military batteries." So if the sun ever sets on the Empire, perhaps the necessary illumination will be supplied by mercury batteries.

The Mallory ads, mentioned above, gave no credit to the metal; no lay reader would necessarily realize that quicksilver (in the form of red mercuric oxide) was part of the Tropical Dry Battery.

New Chemical and Industrial Uses

The Gallowhur Chemical Corp. was much more expansive toward the metal, in its full page ad in *Time* of September 3, 1945. Headlining its display "Miracles from Mercury," it showed a large hand attempting to clutch a few drops of the metal, and it went on to say:

"You may not be able to put your finger on mercury . . . but you can put your hands on new, miraculous products from mercury—thanks to the composite hand of research chemistry and far-sighted business management.

"This hand has captured the illusive power of Mercury . . . (in order) to create formulas that give lasting and effective protection against fungus and bacteria in textiles, cutting oils, paper, paints and agriculture. It has . . . served to protect millions of yards of military fabrics from the ravages of mildew . . .

"Puritized Division, Gallowhur Chemical Corp., N. Y. . ."

A Mercury Clutch

In May, 1945, *The Journal of Commerce* of New York carried a short article on the Mercury Clutch Corp. of Canton, Ohio. In reporting that this corporation had purchased a plant in Canton "in anticipation of a broad-

ened demand for a clutch utilizing mercury," the article went on to say:

"Only approximately two ounces of quicksilver are required for an individual clutch, but the principal of the . . . clutch lends itself to great usefulness in a large number of fields.

"Among the many outlets . . . is the washing machine industry . . . The clutch is also suited for use in air conditioning units, refrigerator equipment, home workshop machinery, and other applications utilizing small electric motors.

"(This) . . . could result in a tremendous postwar consumption of the metal . . .

"Mercury clutches are already being employed on helicopters and fire engine pumps. Use of clutch in . . . home appliances overcomes two major handicaps . . . too high starting current, and an inadequate voltage at the motor . . ."

Mercury in Gyro-Compasses

The most interesting recent advertising material having to do with quicksilver, came in the form of a booklet from the Chrysler Corp. It is called "A War Job 'Thought Impossible'," is by Wesley W. Stout, and tells of Chrysler's part in manufacturing Sperry gyro-compasses. In describing the apparatus, Mr. Stout had this to say:

"A frame supporting four cups of mercury and called a 'ballistic' does for the rotor what the boy's stick does to the hoop. Mercury is a very heavy, liquid metal and so is very sensitive to gravity. As the earth turns from west to east, one side of the ballistic tends to rise, the other to drop. The mercury feeds through connecting tubes from the high to the low side to restore the level. In doing this, Dr. Sperry made it exert this precessive force.

"The rest is automatic. As the earth always revolves from west to east and as precession is always felt 90 degrees away from the point of application, then the gyro spinning axis is forced to right angles from west-east. This right angle is south-north (Mr. Stout explains). While the earth goes on turning and the mercury column goes on compensating, the mercury constantly kicks the rotor back on the south-north meridian. A compass card or azimuth ring with its zero graduation aligned with the rotating axis of the gyro then always will register true north . . .

"The first compass . . . (registered) the outrageous error of 28.2 degrees, or enough to deflect a ship sailing for Liverpool to the bulge of Africa . . . (Our) men repeatedly took it apart and put it together . . . checking every detail with blue prints and specifications, without reducing the error, let alone correcting it.

"By a process of elimination, the error was traced to the mercury ballistic, yet every dimension here was closer than the Sperry prints dictated or the Navy enforced. When the ballistic was removed, however, and that of the Sperry sample substituted, the number one compass quickly settled out to within 2 degrees of north.

"There is a breather on the ballistic to allow the escape of air as the mercury flows back and forth. In the breather is a strand of wool intended to keep dust out. The specifications called merely for a 6-in. strand of white wool yarn. There was no mention of weight or twist.

"When the wicking bought by Chrysler under these specifications was compared it was found to be markedly different from the loosely twisted wicking of the Sperry sample compass. The denser wick was interfering with the escape of air and so slowing the compensating flow of mercury. The 'bug' was in the seemingly least important detail of a precision instrument, a bit of wool. With a strand of ordinary knitting yarn bought in the nearest 5-and-10, the first compass settled out to an error of .1 degree, or substantial perfection."

"Fortune in Mercury"

Descending to advertisements of lesser calibre, *The Mining Record* (of Denver) has one from a Texan in its classified section of April 5, 1945. Headed "Fortune in Mercury," it dared you to "Let your own engineer verify facts—assays run from 20 per cent to 35 per cent!" The exclamation point is appropriate. "Price of \$35,000 includes patented furnace that recovers 97 per cent of Hg—it's a steal at this price—will sell mine or patent separately."

In the *California Mining Journal* of March '45, a Nevadan offers "Quick-silver, Cinnabar—Three hundred thousand dollars cash. Twenty thousand tons per day, good furnace ore. Eight wide and long ore bodies outcropping. Good road . . ."

The Story of Almaden

It is a far cry from such missed opportunities to the largest quicksilver mine in the world, but we can make it via an excellent article by Walter A. Janssen of the U. S. Bureau of Foreign and Domestic Commerce. In "The Story of Almaden," presented in the *Foreign Commerce Weekly* of August 25, 1945, Mr. Janssen says, in part:

"The mineral deposits which constitute modern Almaden . . . (are) 3 nearly parallel ore bodies trending east and west standing vertically . . . about 30 meters apart and each . . . a portion of a bed of Silurian quartzite impregnated with cinnabar . . .

"The north vein is known as the San Nicolás, the middle vein as San

Francisco, the south vein on its east half as San Diego, and the west half as San Pedro..." Californians please note.

"... The introduction of new machinery in 1874 caused discontent among the workmen who thought their services would no longer be needed. They arose in rebellion and killed the engineers..." The present Almaden operators (representatives of whom visited California in January, 1946, inspecting modern plant construction and practice) might well draw a lesson and a warning from that event.

"... The... workings... are conducted in 13 galleries separated from one another approximately 30 m., the depth of the mine at the fourteenth level being 368 m....

"... (The deposits) have great depth and continuity of ore value and crystalline structure. The average content... is about 6 to 8 per cent; as a comparison the Italian occurrences... have a... content... 0.8 per cent..."

"During the eighteenth century, prison labor was used, with little precaution to avoid mercurial poisoning, and the mine became justly ill-famed. Since 1901 free labor has been used, but the tradition of terror made it difficult to recruit labor.... The company has gone to great lengths to minimize mercury poisoning. In addition to... medical treatment, other benefits enjoyed by the workers include (1) exemption from military service and taxes, (2) pensions to widows and orphans of men who lose their lives in the course of their work, (3) (industrial) school for children..., and (4) a school for foremen....

"The total force is 2,400 men, of whom 1,500 work underground. The... pay for miners is 39 pesetas daily, plus various benefits which bring the wage up to 50 ps. For this... they work 6 hours (per day), and... only 8 shifts per month—for which they are paid 400 ps. (about \$36)... Specially hazardous work, such as working mercurial fluedust, is limited to 2-hour shifts, 8 shifts per month. The use of... masonry re-ventment,... long since outmoded, represents about 20 per cent of the total pay roll.

"Eighty per cent of total operating costs is... labor.

"... Production during the last 5 years has averaged 58,000 flasks per year at an average cost of 232 ps. (about \$21), for which... (was) received \$115 to \$250 a flask. Total profits have been... (about) \$50,000,000 on sales... to the Allies... the Axis... (and) the neutrals..."

"With modern equipment and methods... and with a scientific treatment of the labor problem and the hazard of... poisoning, mercury

... could be produced for about 110 ps. (about \$10) a flask.

"... 2,400 men are employed where less than half that... would be sufficient."

Mr. Janssen then gives production figures, showing the average to have been approximately 12,000 flasks per year through 1899, 28,000 per year from 1900 through 1925, and 49,000 per year from 1926 through 1944. The grand total, for the 445 years from 1500, is 6,541,740 flasks. Quoting Mr. Janssen again:

"What does the future hold for Almaden...?"

"There are 250,000 tons of 6 per cent proven ore and 650,000 tons of 2½ per cent probable ore, or 20 years' life at the current rate of 50,000 flasks a year....

"Occurrences of unproven and possible ore are known to exist within (a) 25 kilometer radius..., and to these Almaden has exclusive mineral rights...."

I will terminate this rather depressing subject by quoting from *Mineral Trade Notes* of September 20, 1945:

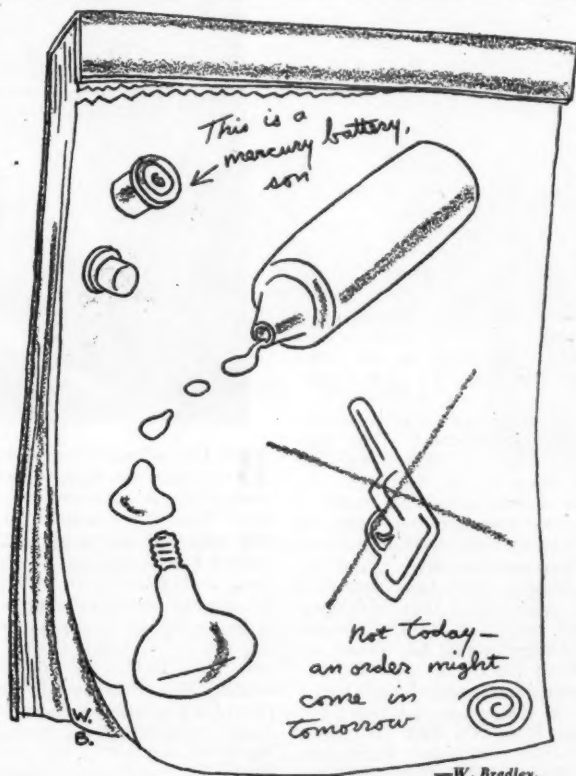
"The Almaden furnaces started operating on May 1, 1945, and are treating ores stored since last December." Production was 4,859 flasks for the first month of operation, 4,362 in June, 1945, and "Stocks on hand July 1... were approximately 71,000 flasks."

Italian Production

Turning to the second most important world producer, *Mineral Trade Notes* of November 20, 1945, has this to say about Italy:

"The production of mercury in Italy was greatly expanded during the war—from 42,732 flasks... in 1936 to a maximum of 94,160 flasks in 1941. Production, which was completely suspended owing to demolition of power... and reduction plants in Tuscany by the Germans,... and the loss of the Idrian mines, has been resumed, and production is about 2,600 flasks a month from... Tuscany.... Stocks... on September 30, 1945, were 26,500 flasks.... Resumption of sales will provide foreign exchange and benefit Italy's economy....

"... The developed ore reserves (of the Tuscany mines) are sufficient for about eight years, and the tonnage of probable and possible reserves indicate... (production) for many decades. The grade of the ore mined has averaged 1.29 per cent mercury in recent years." This is higher than Janssen's figure of 0.8 per cent given above, but Janssen may have included the Idrian ore, which is lower grade (0.6 per cent, 1938 to 1943) than that of the Monte Amiata mines in Tuscany. Incidentally, "the Idria mine has now been taken over by the



—W. Bradley.

A mercury miner's memo pad

Yugoslavs" (quoting again from *Mineral Trade Notes*), but that mine during the 1938-1943 period had accounted for only "15 per cent of Italy's total output."

"Tower" and Scott type furnaces are used at the Monte Amiata mines. "Plans to introduce the Gould-type rotary furnace were being considered just before the war." Wood-fired rotary kilns are used, however, to dry the ore "from 18 per cent to under 8 per cent" moisture before entry into the fine ore furnaces.

"A representative of the Italian producers was recently in Spain, and it was decided to reestablish the Cartel arrangements as before the war, giving Italy 45 per cent and Spain 55 per cent of the export trade and to reduce the price to \$130 a flask" (from the wartime equivalent of \$250). It sounds just like old times.

Production in China

Turning to still another country, China has announced a 5-year metal-production program. *American Metal Market* of June 6, 1945 (which was in turn quoting *Foreign Commerce Weekly*) reported that exports of mercury "may be expected to increase from 120 tons the first year to 450 tons in the fifth year." These are metric tons, and the respective conversions would be to 3,481 and 13,054 flasks.

Time of December 3, 1945, told a strange story. Under the heading "China" and the sub-heading "Myth vs. Fact," it was said: "The Russians may be stripping Manchuria's factories, but there is no evidence of it in Suichung. This southwestern outpost of Jap and Russian occupation has only one factory—a mercury refinery erected years ago.

"I (*Time* correspondent William Gray) visited that plant with General Tu's . . . political adviser, . . . and a . . . geologist named Gao. . . Mr. Gao understands and speaks some English and I asked him what he had found here. He threw up his arms and cried lugubriously: 'All is destroyed!'

"This, it developed, was a rather remarkable misstatement. The furnaces were intact. Somebody had stabled a horse in the building. . . . Otherwise it was spick and span."

There was presumably a mine in the vicinity, although not mentioned by the *Time* correspondent. And the thought occurs that Gao, being a geologist, might have been referring to the mine workings, rather than the plant buildings, when he waxed so lugubrious.

Two more items, and the odds and ends will be cleaned up for now.

The San Francisco Bay district is still (at this writing, February, 1946) in the throes of a machinists' strike which started last November. One of the strike's by-products is a

sight which brings back memories of the early '30's: unemployed men panning for gold on the ocean beach. The *San Francisco News* of February 8 has a photograph of two ex-machinists working a home-made rocker, with the caption in part: "Trough is copper, lined with mercury." It is a strange twist of fate which produces such a consumption of metals, however slight.

The Origin of a Phrase

In the well-publicized book "Try and Stop Me," by Bennett Cerf, there is this under the heading "The Good Old Days":

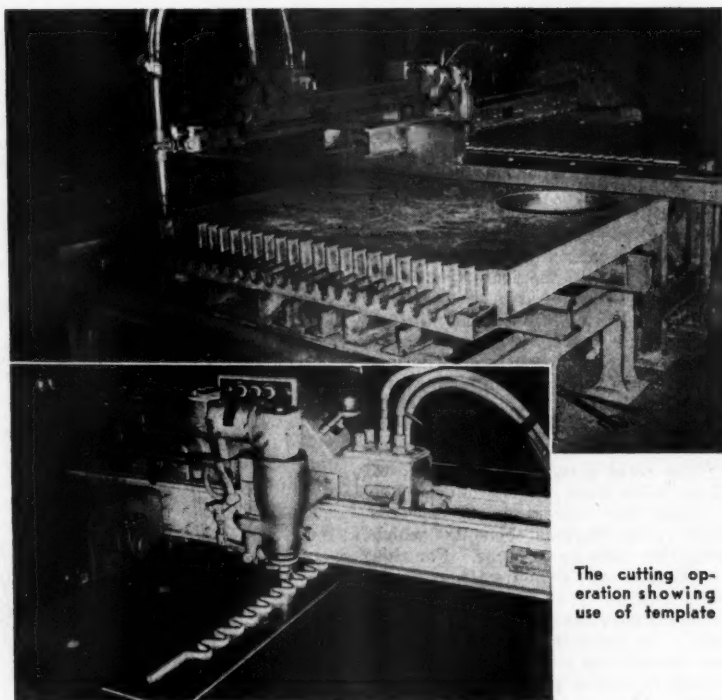
"Exploring the Dangerous Trades," by Dr. Alice Hamilton, reveals the true origin of the phrase 'mad as a

hatter.' Dr. Hamilton explains that mercury is used in the making of felt hats, and the poison resulting from its use over a period of years eventually caused the unfortunate victims' muscles to jerk violently and involuntarily. The hatters' friends drew false conclusions."

Lest my readers also leap to false conclusions, I hasten to point out that the Cerf book cannot be considered an entirely reliable source of information (Cerf's account of the famous Rose Bowl game wrong-way run is garbled, for one thing).

And speaking of leaping at conclusions, my readers—if there be any left, and not too exhausted—can now jump with joy at the conclusion of this article.

Novel Flame-Cut Operation



The cutting operation showing use of template

BY USING an oxy-acetylene shape-cutting machine, a mid-western steel plant is reported to have saved more than 50 per cent of the cost of a new piece of equipment. This plant needed a replacement for a cinder car rack, a structure 5 ft. by 4 in. by 2½ in., used to hold the cinder car while it is being tipped to discharge its molten slag. The original rack had been cast. To avoid the high cost and lengthy delay that would be involved in making a pattern and mold for the single replacement, it was decided to flame-cut the part from a 5 in. thick steel slab with an Oxweld CM-12 shape-cutting machine.

Since only a limited number of the

racks were to be cut a templet for guiding the cutting machine was sawed out of ¼-in. composition board instead of using the standard aluminum templet strip. This faster, cheaper method was entirely satisfactory for this application because the templet was used only a few times.

Total cost for material and cutting for each rack was estimated at \$18.30 as compared with \$40, the estimated cost of a new cast part. Flame-cutting was sufficiently accurate so that no machining of the part was necessary. A further saving is realized by this steel plant since it is now unnecessary to stock these racks as replacements or wait for deliveries.



Digging With a Magnetorque Bite...

No matter how tough the digging or what the material, the bite of P&H's Magnetorque hoist is driving tonnage costs lower than ever before thought possible.

This unit—used for hoisting only—replaces about two thirds of the usual motor generator set. It actually eliminates the hoist generator, its commutation problems, reduces peak power demands to a minimum. It also eliminates the hoist slip

clutch, its headaches and high maintenance costs.

Power for hoisting—under operator's control—is transmitted by electro-magnetic forces. A simple AC squirrel cage motor drives the hoist machinery through the Magnetorque unit without sacrifice of speed, control or responsiveness. Lowering is by gravity so the hoist motor never reverses.

Born of P&H's 60-year leader-

ship in applying electrical power to the movement of heavy loads, the Magnetorque unit is another forward step toward more dependable digging at lower cost in all kinds of open pit operations. Write for complete information.

P&H

**ELECTRIC
SHOVELS**

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HARNISCHFEEGER

CONCRETE - ELECTRIC HOISTERS - AIR WHEELS - CRANES - WELDING ELECTRODES - MOTORS

LEADERS IN ELECTRICAL SHOVEL DEVELOPMENT

American Mining Congress Annual Coal Convention

CINCINNATI, APRIL 29-30, 1946

Preliminary Program

MONDAY MORNING—COAL'S FUTURE

ECONOMIC PROBLEMS OF THE COAL INDUSTRY

G. A. LAMB, *Assistant Director, U. S. Bureau of Mines*

LOCOMOTIVE FUEL ECONOMICS

J. I. YELLOTT, *Director of Research, Locomotive Development Committee*
Bituminous Coal Research, Inc.

ECONOMICS OF DOMESTIC HEATING

B. F. GEBHART, *Vice President, Chicago, Wilmington and Franklin Coal Co.*

Monday Noon—Luncheon

MONDAY AFTERNOON—COAL BENEFICIATION

HEAVY DENSITY PROCESSES FOR COAL BENEFICIATION

D. H. DAVIS, *Product Control Manager, Pittsburgh Coal Co.*

DRYING COAL THERMALLY AND MECHANICALLY

LANING DRESS, *Preparation Engineer, Pyramid Coal Corporation*

ANTHRACITE RECOVERY OF FINE SIZES

W. H. LESSER, *Pierce-Management*

TUESDAY MORNING—DEEP MINING

MECHANICAL MINING IN THIN SEAMS

J. J. SNURE, *Assistant Production Manager*
Rochester & Pittsburgh Coal Co.

MAINTENANCE OF UNDERGROUND AND SURFACE EQUIPMENT

WILLIAM BURNETT, *Electrical Engineer*
Peabody Coal Co.

MECHANICAL MINING IN THICK SEAMS

GEO. R. HIGINBOTHAM, *Production Manager*
Consolidation Coal Co.

TUESDAY MORNING—STRIP MINING

RECLAMATION AND CONSERVATION OF STRIPPED-OVER LANDS

L. E. SAWYER, *Director, Forestry and Reclamation, Indiana Coal Producers' Association*

JAMES W. BRISTOW, *Secretary-Treasurer*
Illinois Coal Strippers Association

R. T. LAING, *Executive Secretary*
Minerals Producers Assn., Pennsylvania

Tuesday Noon—Luncheon

TUESDAY AFTERNOON—DEEP MINING

MODERNIZING THE MINE ORGANIZATION

R. E. SALVATI, *Vice Pres., Island Creek Coal Co.*

SAFETY PRACTICES AT MINES OF UNION PACIFIC COAL COMPANY

F. J. PETERNELL, *Safety Engineer*
The Union Pacific Coal Co.

UNDERGROUND HAULAGE WITH LOCOMOTIVES AND MINE CARS

C. C. HAGENBUCH, *Asst. to Vice President, and*
C. R. NAILLER, *Gen'l Manager, Hanna Coal Co.*

UNDERGROUND HAULAGE WITH BELTS

RAY COBB, *Superintendent, West Kentucky*
Coal Co.

TUESDAY AFTERNOON—STRIP MINING

FUTURE USE OF RUBBER IN STRIP MINING

J. G. BERRY, *Field Engineer*
Tire Engineering Department, United States
Rubber Co.

LARGE DRAG LINE EXCAVATOR IN COAL STRIPPING

R. M. DICKEY, *Sales Engineer*
Bucyrus-Erie Co.

STRIP MINING TWO SEAMS

R. PAUL MAUGER, *President*
Mauger Construction Co.

Annual Dinner—Tuesday Night

Post-War Problems To Be Stressed at Cincinnati Meeting

*All Indications Point to Wide Interest and
Large Attendance*

THE question before the coal convention of the American Mining Congress at Cincinnati, April 29 and 30, will be how the coal industry can win the peace. Conversion has been a simple matter; in fact no "change over" period was needed after V-J Day, as coal continued to be mined in exactly the same way as during the war. However, changes are coming—war-time pressure for large tonnage has ceased but in its place we now have economic pressure for low cost and high quality; so instead of conversion we are facing a readjustment to the new conditions which are arising.

If the industry is to meet these conditions, there must be a closer coordination between all branches of coal mining than we have ever had before and a closer correlation of all phases of production—mining, preparation, marketing, utilization and research. This coordination and correlation can not be made through the individual efforts of a few; to be effective it must result from the combined action of many and the main purpose of the convention will be to bring together the three major units of the industry—operating, selling and manufacturing—to discuss and solve problems which are common to all.

The program on the opposite page shows the speakers and subjects as selected by the Program Committee. These speakers are well qualified by experience to present their subjects, and following each paper floor discussions will bring out all possible ideas on what can be done to further the cause of post-war coal mining.



GEO. L. SMITH
National Chairman
Program Committee



HARRY M. MOSES
Chairman
Coal Division



H. V. BROWN
Chairman
Manufacturers Division



- ★ CORRECT FIT
- ★ LONGER WEAR
- ★ FACTORY ENGINEERED
- ★ CORRECTLY HEAT TREATED
- ★ PRECISION MADE



Quick Delivery



You'll find genuine Joy gears give longer life and better service as their forged construction makes them more rugged. All Joy gear metal is heat treated correctly after forging to hold maximum strength.



Joy chains and flights for loading machines are specially designed for maximum utility. Extra-strong chain construction and patented linkage resist pulls from heavy loads. Joy engineers have produced a balanced design between the chain and flights.



Maximum performance of loaders and shuttle cars can only be secured with the right combination of electrical factors. In genuine Joy motors and controls, voltage, amperage, horsepower and speeds have all been carefully coordinated. Joy designs specifically for the type of car, loader or conveyor you're using, so there can be no question of an exact match.



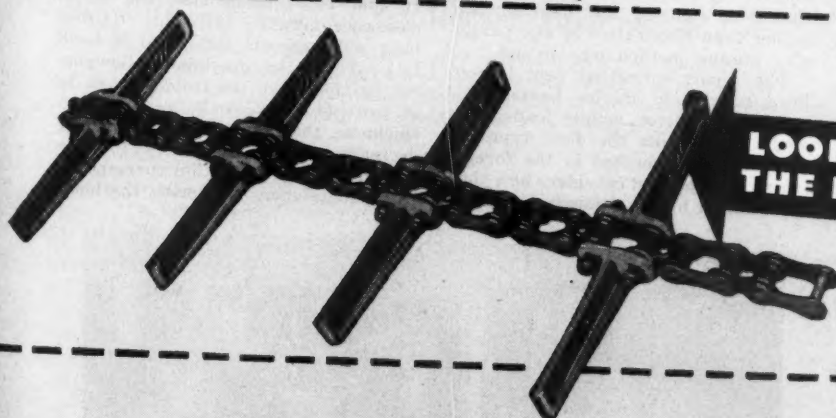
*Joy Engineering
Services are at
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that's why we use
genuine JOY parts to
reduce breakdowns

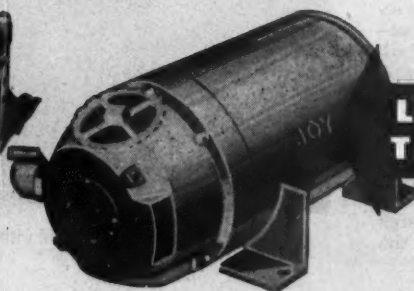
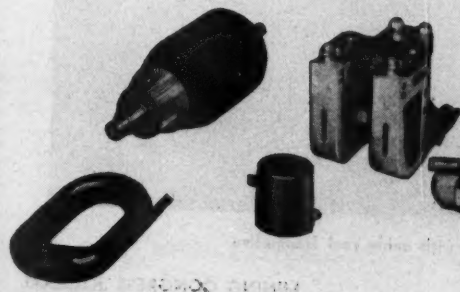
on all JOY PARTS



LOOK FOR
THE NAME



LOOK FOR
THE NAME



LOOK FOR
THE NAME



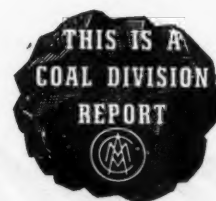
JOY

Manufacturing Co., Franklin, Pa.

Service Haulage Under Various Seam Conditions

Effect of Physical Conditions on the Selection and Performance of Haulage Equipment Used to Serve Mobile Mechanical Loaders

By the Committee on Mechanical Loading



THE physical conditions of a coal seam are, in the final analysis, the determining factors of what methods and equipment should or should not be used in its mining and the failure to recognize this fact is generally followed by some loss of money in addition to greater or less waste of time and effort. Most mining equipment is not custom-made and of necessity has to be built to suit a fairly wide range of seam characteristics; however each type or size does have a limit and its use outside of the range for which it was designed, always results in lowered production and increased costs.

In recognition of the foregoing, the committee in outlining its report on service haulage, felt that the first step should be a study of how the physical conditions underground will affect the plan and performance of the haulage operation. The August, 1945, MINING CONGRESS JOURNAL showed the results of a survey made of conditions under which different classes of equipment are being used but as then stated this survey was not considered conclusive. The present report therefore is presented to amplify the survey with the experiences and observations of the committee.

Definition of Service Haulage

Service haulage for mobile mechanical loaders is the operation of taking coal away from the loading machine at the working face which is accomplished by one of four classes of equipment: (a) mine cars with locomotives, (b) rubber-tired shuttle cars, (c) conveyors, and (d) transfer cars. The service haulage transports the coal for only a short distance; a locomotive takes mine cars to a nearby switch, usually in a room break-through; a shuttle or transfer car goes to an unloading point on the

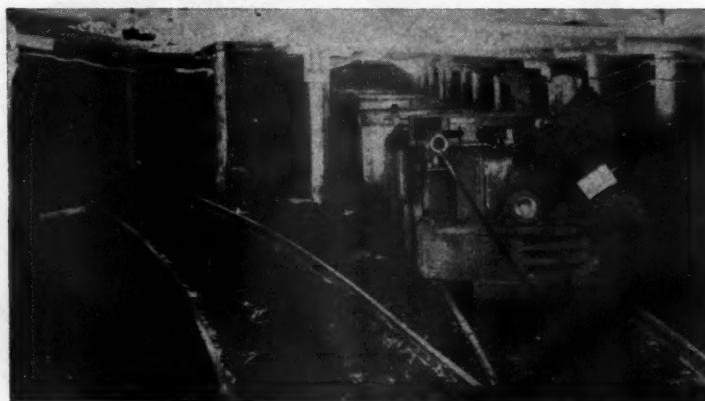
room entry; a conveyor generally discharges at the room neck. Of these four types, mine cars haul the coal, as loaded at the face, all the way to the tippie; the other three, after being loaded by the machine and leaving the working face, transfer their coal to the main line or secondary haulage system. This may be mine cars or belts or a combination of the two but in any case is not a part of this study. The accompanying drawing is presented to show typical plans for each service haulage system and to clarify what the committee report covers in considering operations with mine cars, shuttles and conveyors, but it should be stated that these sketches are diagrammatic rather than illustrative of any particular mining method now in use.

The report submitted here is confined strictly to service haulage for track and tractor mobile loaders; it deals solely with the four types of equipment enumerated in the foregoing paragraph and considers how they are affected by the following physical

conditions—seam height, roof, floor, grades, impurities and mine water. Certain advantages as well as limitations for the classes of haulage equipment are mentioned; this, however, is not with any thought of recommending either for or against but merely to point out the characteristics of each type.

Mine Cars With Locomotives

Seam Height imposes definite limitations on the mine car capacity and at the present time the required clearances take into account 5 in. for rail with steel ties and 12 to 18 in. for the loading machine boom over top of car. If coal is of small size, the 12-in. clearance may be sufficient. (Cross bars will use an additional 4 to 5 in.) Thus, the maximum allowable car height above the rail is about 30 in. for a 48-in. seam. Below this seam thickness, the capacity of the mine car decreases and its efficiency for the service haulage operation correspondingly diminishes. Lowering the load-



Shifting cars with cable reel locomotive

ing end of a mine car or increasing its length or width, will modify the above statements and dimensions.

Roof conditions may affect the mine car capacity by reducing the top or side clearance when heavy timbering is required. Usually, however, the most serious effect of bad top is on the tons per man per unit loading crew, caused by increased labor and the need of additional places to keep preparation ahead of loaders.

Mine Floor is a major consideration in the selection of type of haulage equipment. A natural soft bottom will favor the use of track.

Track Grades generally must be not greater than 4 per cent if full efficiency of mine cars with locomotive haulage is to be secured. A locomotive with steel tires has on level dry track 25 per cent adhesion; every 1 per cent of grade requires 20 lbs. per ton draw bar pull for the trips and the locomotive also requires the same amount. The following table indicates how grades affect the performance of an eight-ton locomotive when hauling cars with anti-friction bearings:

	Gross Load
Level grade—haulage capacity...	200
Up 1% grade—haulage capacity...	96
Up 2% grade—haulage capacity...	61
Up 3% grade—haulage capacity...	44
Up 4% grade—haulage capacity...	33
Up 5% grade—haulage capacity...	26
Up 6% grade—haulage capacity...	21
Up 7% grade—haulage capacity...	18
Up 8% grade—haulage capacity...	15

Thus, an 8 per cent grade, unless sand rails are installed, is the maximum for hauling cars with mine locomotives of the conventional type.

Seam Impurities are handled in one of two ways—by loading into mine cars or stowed underground. The method of moving this material and



Shuttle transfers coal to secondary haulage

disposing of it is usually determined by such factors as the character and thickness of the partings and the system of mining rather than type of service haulage. However, mine cars are especially suitable for hauling large and heavy pieces of rock.

Mine Water in considerable volume and acid in nature will deteriorate both metal and rubber. Drainage must be adequate to permit service haulage to operate efficiently in wet conditions.

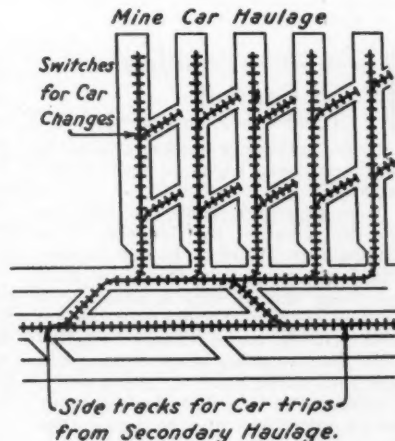
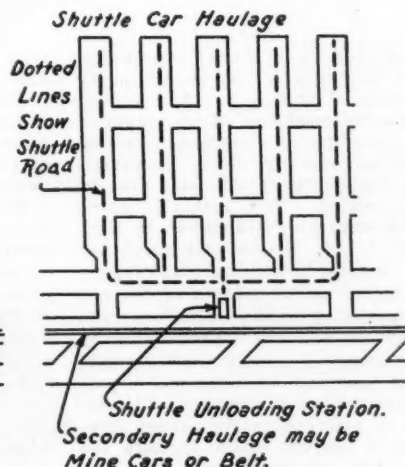
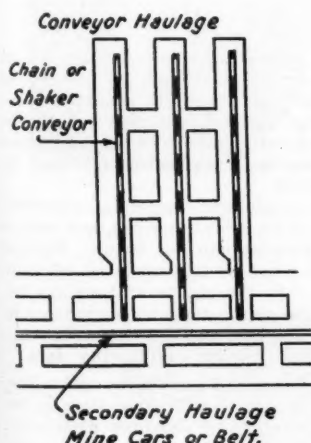
Rubber Tired Shuttle Cars

Seam Height as in the case of mine cars, limits the size of the shuttle car. However, the conveyor bottom provides low end loading clearance for

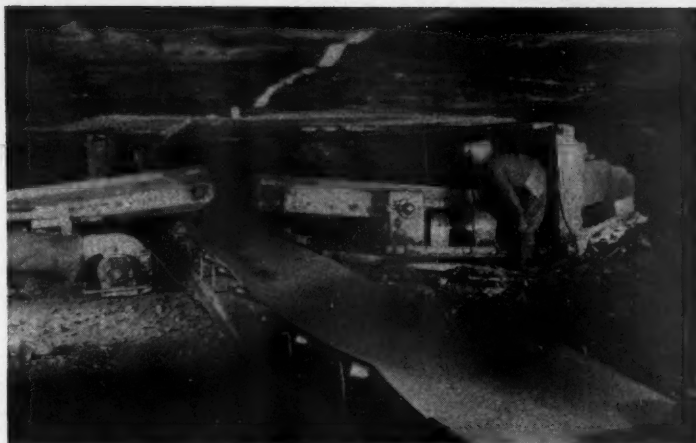
the machine boom and shuttles can therefore work in thinner seams than mine cars. Heights as low as 36 in. are now operated successfully.

Roof Conditions impose clearance limitations when heavy timbering is needed but the main effect is to add men to the timber crew. It is, of course, a primary requisite to have haulage ways safely timbered, regardless of the type of equipment used. With four-wheel-steering shuttle cars, the same clearance may be used on turns as for mine cars. Where two-wheel steering is used, extra clearance is required.

Mine Floor is a major consideration in rubber-tired haulage; no rolling equipment can be used efficiently ex-



Sketches illustrate typical service haulage methods with mine cars, shuttles and room conveyors



Room conveyors discharge to entry belt

cept on a proper road bed, and in shuttle car operation this roadbed must be provided naturally by the mine floor rather than by artificial means. Local soft spots in the floor should be bridged over but this bridging is expensive if needed on a large scale.

Grades do not affect rubber-tired haulage to the same extent as locomotives and on dry bottom the coefficient of friction of rubber is relatively high, so that steeper grades can be negotiated than with mine cars. However, the same amount of power is needed to elevate a given load up a given grade at a given speed, whatever type of haulage equipment is used. In general, where adhesion is sufficient, a shuttle will travel any grade that can be worked by a tractor loader but the efficiency of the operation drops rapidly when 8 per cent is exceeded.

Seam Impurities are handled in the same way and with about the same

effort in shuttles as in mine cars except that in some mines the shuttle has been used to transport slate from the face and stow it in a worked-out place nearby. When practicable, this is an economical operation for which the mine car is not suitable.

Mine Water and especially acid water must be adequately handled for all equipment, otherwise higher maintenance will result.

Conveyors

Where conveyors are used for service haulage, the chain type predominate although shakers have had a limited use; belts, however, have not yet been applied for direct loading by a mobile machine. Certain loading devices such as the power duckbill, the shortwaloader and other low-seam loading machines mounted on caterpillars or rubber tires are designed particularly for conveyor loading, regardless of seam height.

Seam Height has no lower limit as

far as the conveyors themselves are concerned as the minimum seam thickness practicable for mining is governed by the height of the loading or cutting machine and by economic factors. The use of conveyors for service haulage with mobile loaders in high coal is of course entirely practical but so far only a few installations of this type have been made.

Roof Conditions are always a consideration but conveyors permit much closer timbering in bad top than is possible with either mine cars or shuttles.

Mine Floor has little effect on conveyors and grades are not a serious factor as conveyors will transport either up or down any grade that a loader can operate.

Impurities in the seam can to some extent be gobbled with the loading machine as the comparatively narrow conveyor-way provides more stowing space in the rooms than is possible with either mine cars or shuttles.

Mine Water will cause deterioration of conveyors, and adequate drainage or pumping must be provided.

Transfer Car

The transfer car, in effect, is a track-mounted shuttle and consists of a large capacity car on mine track operating between the loader and the entry haulage. The method is useful where the regular mine cars are of too small capacity for efficient mechanical loading and where some limit such as track gage or size of shaft prevents larger haulage equipment on the main line. The requirements of height, roof, floor, etc., are similar to those which apply to mine cars.

Approved by the subcommittee,
December 13, 1945.

H. THIES,
R. S. BIGELOW,
E. H. JOHNSON.

Flood Prevention and Control

(Continued from page 34)

in the anthracite region should be authorized and begun as soon as possible.

The procedure from the initiation to the adoption by Congress of a flood-control project is not understood generally, and this more than anything else is why a problem so serious as the anthracite flood-prevention problem has advanced little beyond the discussion stage, although it has been talked about for many years. Conditions have now reached the point where something must be done or the consequences can prove to be far-reaching.

In the first place, a flood-control project must be initiated by the local

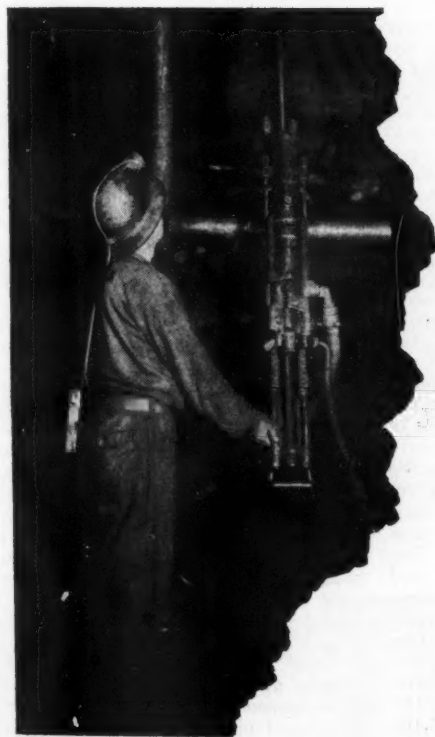
people and their elected representatives in Congress. By an act, or by insertion of an item in a flood-control act, or by resolution of an appropriate committee of Congress, a preliminary engineering survey is authorized for which funds must also be appropriated. This authorization is in the nature of a directive by Congress to the Department concerned for a specific investigation and report. Dependent on the nature of the authorization, available records in the region affected are supplemented by reconnaissance or detailed surveys, public hearings are held, and a preliminary report is prepared. This report is referred to the proper Government agency, which, through the Secretary of the department concerned, may transmit the matter through the Bureau of the Budget,

with definite recommendations for or against the construction project or projects given in the report. After passing through hearings before the appropriate committees in both Houses of Congress, final action is taken by Congress.

When projects comprising construction works are authorized, and before construction can be begun, Federal funds must be appropriated by Congress. In the course of hearings before the appropriations committees of Congress, the projects must be supported by sound engineering data.

It is evident from the foregoing discussion that considerable time is required for the procedure necessary; however, such a course develops useful plans, weeds out unworthy proposals, and places meritorious projects in line for adoption by Congress.

What they say . . .



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GARDNER-DENVER

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Mining Congress Holds Forty-Eighth Annual Meeting

THE Forty-eighth Annual Meeting of the American Mining Congress was called to order by Howard I. Young, president, at a luncheon gathering on February 13, 1946, in the South American Room of the Hotel Statler in Washington. A large and representative attendance included metal, coal and non-metallic mine operators and manufacturing executives from all parts of the United States.

Prior to the official opening of the meeting, the Resolutions or Policy Committee had been in continuous session during the preceding day. Because of the serious problems of reconversion and of pending national legislation, the work of this committee was both exacting and lengthy. Simultaneously the Tax Committee was also in session and by the time the luncheon meeting opened, a tremendous amount of work had already been accomplished on the various and comprehensive problems facing the mining industry.

Officers Address the Meeting

Opening his remarks by complimenting the mining industry on its whole-hearted cooperation throughout the period of the war, Mr. Young expressed the hope that this same cooperation would continue in the new problems now arising. The American Mining Congress, he said, is today in the best position it has ever been, both financially and with respect to the interest taken in its work by the entire mining industry. Mr. Young discussed briefly the misconceptions arising from statements that the United States is becoming a "have-not" nation.

He spoke of the need for continued effort in keeping the public informed as to how business functions, and why it must be allowed to continue to operate with a minimum of government interference, in order to preserve the industrial system of this country.

Mr. Young then introduced the Secretary of the Mining Congress, Julian D. Conover, who presented a report on the work of the organization since the last general meeting in December, 1943. His report is carried in full in this issue on pages 50-55.

Andrew Fletcher, vice president of the St. Joseph Lead Company and chairman of the Finance Committee, was called on for a report as to the finances of the American Mining Congress. This showed the Congress to be in a strong position with a good cash balance and excellent support from all branches of the industry.

Taxes Discussed

The president then called upon Henry B. Fernald, chairman of the Tax Committee, stating that this is one of the hardest-working and most effective committees in any organization in the country. Mr. Fernald gave a concise summary of the present Federal tax situation as it affects the mining industry. He discussed the prospects of further tax revision in the present session of Congress, indicating that only limited progress may be made towards a permanent postwar program, or in amendments to remedy the effects of the excess profits tax. He expressed the view that reductions in taxes can be successfully urged only as it is shown that they are essential to permit maximum productivity and activity and maximum government revenues.

Mr. Fernald pointed out that in the twenties the government had an income of about 3 billion dollars a year, of which roughly one billion came from individual income taxes, one billion from corporation taxes and the remainder from other sources. The postwar national budget has been estimated between 25 and 30 billion with an estimated income from personal taxes of about 11 billion dollars. Mr. Fernald reviewed the distribution of the taxable income of individuals, showing that the great bulk is in the lower brackets and that if expected revenue needs are to be met no large reduction in tax rates applicable thereto will be possible. His brilliant resume of the tax situation was listened to with profound attention by all present.

Howard Huston, assistant to the president of the American Cyanamid Company and chairman of the Social Security Committee, reported that the House Committee on Ways and Means is expected to revise the Social Security Act during the present session of Congress, but that as yet no hearings

have been scheduled. Meanwhile his committee is studying the staff reports on this subject.

Directors Elected

The Nominating Committee, consisting of R. C. Allen, Robert P. Porter and Frank C. Wright, Jr., reported the following nominations to the Board of Directors of the American Mining Congress:

To serve as Directors for 2 years (term expiring January, 1948) — Donald A. Callahan, Pres., Callahan Consolidated Mines Co., Wallace, Idaho; Louis S. Cates, Pres., Phelps Dodge Corp., New York City; Andrew Fletcher, Vice Pres., St. Joseph Lead Co., New York City; James D. Francis, Pres., Island Creek Coal Co., Huntington, W. Va.; Herbert C. Jackson, Pickands, Mather & Co., Cleveland, Ohio; William J. Jenkins, Pres., Consolidated Coal Co., St. Louis, Mo.; Robert H. Pearson, Vice Pres., Gardner-Denver Co., Quincy, Ill.

To serve as Directors for 3 years (term expiring January, 1949) — Arthur E. Bendelari, Eagle-Picher Lead Co., Lexington, Ky.; Worthen Bradley, Pres., Bradley Mining Co., San Francisco, Calif.; Ralph E. Jamison, Vice Pres., Jamison Coal & Coke Co., Greensburg, Pa.; George H. Love, Pres., Pittsburgh - Consolidation Coal Co., Pittsburgh, Pa.; Thomas McNally, Pres., McNally-Pittsburg Mfg. Corp., Pittsburg, Kans.; David D. Moffat, Pres., Utah Copper Co., Salt Lake City, Utah; Jesse B. Warriner, Pres., Lehigh Navigation Coal Co., Philadelphia, Pa.

These nominations were unanimously approved and the members thus named were declared elected. Additional members of the Board of Directors, elected in December, 1943, and continuing in office through 1946, are: Edward J. Burnell, Vice Pres., Link-Belt Co., Chicago, Ill.; V. P. Geffine, Vice Pres., Cleveland-Cliffs Iron Co., Cleveland, Ohio; James R. Hobbins, Pres., Anaconda Copper Mining Co., New York City; Neil W. Rice, Pres., U. S. Smelting, Refining & Mining Co., Boston, Mass.; Merrill E. Shoup, Pres., Golden Cycle Corp., Colorado Springs, Colo.; Grant Stauffer, Pres., Sinclair Coal Co., Kansas City, Mo.; Howard I. Young, Pres., American Zinc, Lead & Smelting Co., St. Louis, Mo.

The next order of business was the report of the Resolutions Committee, headed by Donald A. Callahan, and read to the meeting by Mr. Huston. A forthright Declaration of Policy on current matters of public concern was presented and unanimously adopted. The full text is given on pages 56-59.

Talks by Industrial Leaders

The President then called upon a number of leaders in the industry for brief remarks.

Mr. Callahan, after speaking of the wide ramifications of the work of the Mining Congress, paid special tribute to the man who has headed the organization during the past 12 years—Howard I. Young. A rising vote of thanks was spontaneously given to Mr. Young for his inspiring and unselfish leadership. Mr. Callahan warned those present against the proposed creation of "valley authorities" with powers transcending those of the State and local governing units,

as presenting a great danger not only to those engaged in developing natural resources, but to the freedom and welfare of all Americans.

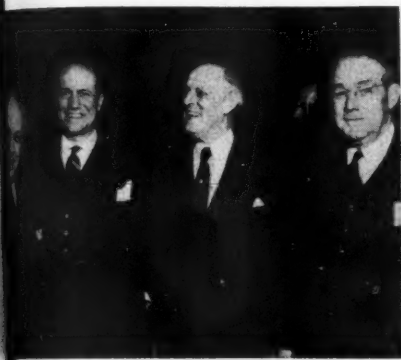
Messrs. Louis S. Cates, Rolla D. Campbell, R. C. Allen, William Van C. Brandt, Edward J. Burnell, Merrill E. Shoup and Jesse B. Warriner discussed matters of concern to the various branches of the mining industry and to mining manufacturers. Particular attention was given to the current labor situation, to the need for amendments of existing Federal law dealing with labor disputes, and to the importance of bringing before the public the full facts with respect to strikes such as have recently paralyzed whole communities and great industries, with incalculable loss to the entire nation.

Following adjournment, the Board of Directors met and elected the following officers for the ensuing year: President, Howard I. Young; Vice Presidents, Donald A. Callahan, Louis S. Cates, James D. Francis; Secre-

tary, Julian D. Conover; Executive Committee, Howard I. Young, Louis S. Cates, William J. Jenkins.

Informal Dinner Well Attended

The meeting closed with an informal cocktail and dinner party given at 6:30 P. M. the same evening, at which members of the House and Senate and officials of Government agencies interested in mining were guests of the American Mining Congress. An excellent buffet supper was served, followed by dancing in the beautiful Presidential Ballroom of the Hotel Statler. The ballroom was tastefully decorated and the tables set around the center of the floor provided ample space for dancing. The refreshment bar was a most popular focus of attention and many old friendships were renewed by the time the evening closed. Nearly 500 members and guests attended this party which was a suitable ending to a most successful meeting.



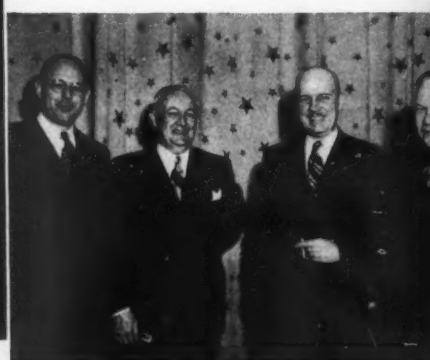
Left to right: Howard I. Young, President, American Mining Congress, and President, American Zinc, Lead and Smelting Co.; Senator James E. Murray, of Montana; Merrill E. Shoup, Director, American Mining Congress, and President, Golden Cycle Corporation



Standing (left to right): Senator Elbert D. Thomas, Utah; Representative Antonio M. Fernandez, of New Mexico; and Representative J. Will Robinson, of Utah; Seated (left to right): Senator Carl A. Hatch, of New Mexico, and Miss Vivienne Camps, Attorney with CPA



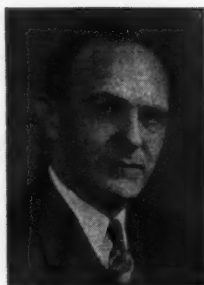
Left to right: Senator Charles C. Gossett, of Idaho; General Kenneth C. Royall, Undersecretary of War; Representative Lowell Stockman, of Oregon; and Representative A. Willis Robertson, of Virginia



Left to right: J. G. Green, Assistant General Manager, Storage Battery Division, Philco Corp.; E. J. Burnell, President, Link-Belt Co.; Shelley G. Hughes, Vice President, Differential Steel Car Co.; and Frank E. Mueller, President, Roberts and Schaefer Co.

Review of 1944-'45

Mining Congress Activities



Report of Julian D. Conover, Secretary, American Mining Congress at
48th Annual Meeting, Washington, D. C., February 13, 1946

MORE THAN two years have gone by since our last general meeting. They have been strenuous years, bridging the critical period of the war and the return to peacetime production. Mining, like other industry, has been controlled by directives from Washington. The industry's ability to function, and its prospects for the future, have been largely determined by the actions of Congress and of the administrative agencies of our Government. Small wonder then that the American Mining Congress, as the industry's Washington representative, has been confronted with more problems, of greater urgency, than ever before—and that we have found it necessary to enlist the aid of our members throughout the country in the common cause.

I will limit this report to a brief review of matters of special importance.

Since our last meeting, the 78th and 79th Congresses have been in session for a total of nearly 20 months. More than 18,000 bills and resolutions have been before them. In our office we have reviewed all of these, have made reports as to those which affected mining, have obtained the views of our members, and have then taken action as called for to protect mining's interests. A like procedure has been followed for the innumerable regulations and orders of the various Government departments and agencies. In many cases, members of Congress or agency officials have sought our views in advance to assist them in reaching sound and workable conclusions, and we have been glad to extend our full cooperation.

Matters in which we have been active, either in advocating desirable

measures or opposing those which would be hurtful, have included:

Stockpiling of Strategic Minerals

In the Surplus Property Act of 1944 this subject received pointed attention. Recalling the disastrous effects of Government dumping of surpluses following the last war, and recognizing the wisdom of maintaining stockpiles for national defense, we advocated that the accumulations of metals and minerals already owned by the Government be impounded in a permanent reserve for military use. Government departments proposed that the matter be deferred, but the Congress agreed with our view and provided in the Act for the "freezing" of Government-held surpluses against the needs of any future war.

A major controversy arose as to

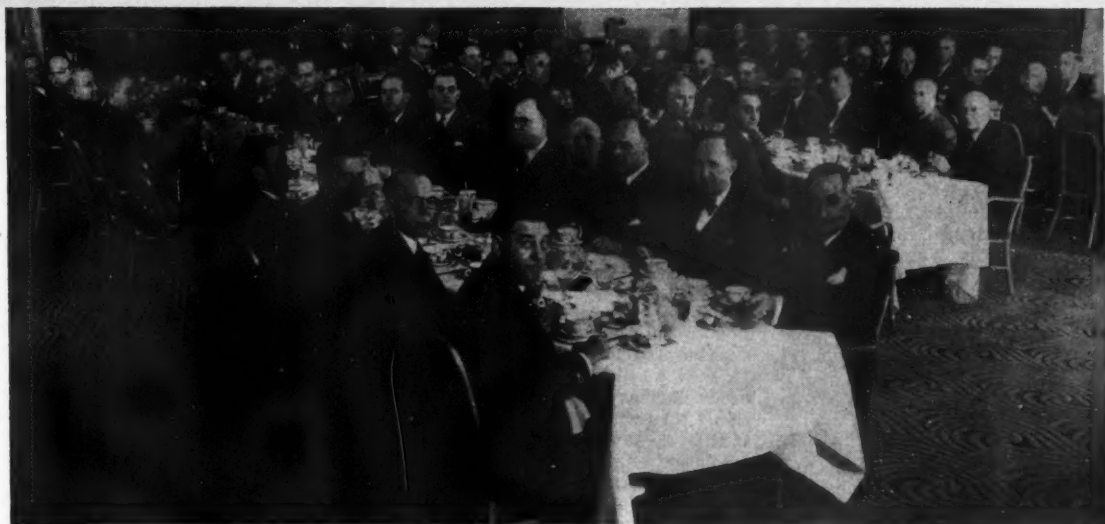
whether metals in the stockpile should be subject to release at any time at the discretion of an administrative agency. We maintained that the stockpile must be held inviolate for defense purposes; that the granting of discretionary authority to dispose of materials would impair, if not destroy, the confidence essential to future planning and development in the mining industry; that the stockpiles should be securely locked up and that Congress itself should retain the key—and this principle was recognized in the legislation then adopted.

The requirement that strategic material surpluses be stockpiled expired in January of this year. To meet this situation, comprehensive legislation has now been acted upon by the Senate and is pending before the House Military Affairs Committee. A chief point at issue has again been the



Time Out for a Friendly Discussion

Howard I. Young, Pres., American Mining Congress, and President, American Zinc, Lead and Smelting Co.; John W. Snyder, Director, Office of War Mobilization and Reconversion; and Louis S. Cates, Vice President, American Mining Congress, and President, Phelps Dodge Corp.



Representative Group of Leading Mining Men Get Together at Members' Luncheon

question of congressional rather than administrative control over the stockpiles, and the present bill contains adequate safeguards in this respect. A "Buy-American" provision affords preference to domestic producers where not inconsistent with the objectives of the Act. It is hoped that the bill will be the subject of early action by the House and approval by the President, who has endorsed the legislation.

Price Control When it became apparent last spring that price control would be extended to June, 1946, efforts were directed toward extension of the Premium Price Plan for copper, lead and zinc. It was clear that the current ceiling prices on these metals would be continued, and equally clear that in view of increased costs the industry as a whole could not operate at these prices. The Plan was extended on a non-cancellable basis for a full year.

A few months ago it appeared likely that price control might lapse without further extension. Subsequent developments, however, indicate a strong administration determination that it be continued. Sentiment in the mining industry generally favors the earliest possible return to a free market, in order that prices may resume their normal role in bringing out needed production and screening out less important uses, and that bureaucratic control of mine operations may be ended. The possible need of special treatment for certain mineralized areas is, of course, recognized. There is also general agreement that if ceiling prices are to be continued the Premium Price Plan should be extended concurrently; and that in any event a reasonable in-

crease in ceiling prices is needed, to reduce the cost of the Plan and lessen the burden on the taxpayer, as well as to relieve many cases of hardship and to provide a more equitable relationship with the foreign market. A bill which has just been introduced by Senator McFarland of Arizona and eight of his colleagues would accomplish these objectives, and seems to afford the best answer if it should become evident that a return to a free market is not in the cards at this time.

In the price control hearings last year, the mining industry assailed OPA's refusal to recognize percentage depletion as a cost item in determining maximum prices for coal, iron ore and other minerals. We pointed out that for mines computing their depletion on a percentage basis as prescribed in the law, percentage depletion is clearly their "established accounting method," and that OPA's action was in violation of the Price Control Act. The OPA recognized its error and reestablished the cost form previously used, although its formula still failed to give full allowance for depletion as currently computed.

Tariffs and Trade Agreements

During the past year the mining industry opposed vigorously the program for extension of the Trade Agreements Act, carrying enlarged authority to reduce tariff duties, and without adequate safeguards for domestic producers. We urged several protective amendments, and specifically that strategic and critical minerals be excluded from further tariff cuts. Senator Bailey of North Carolina sponsored this latter amendment. All these amendments, however, except one by Clinton Anderson safe-

guarding the restoration of the higher postwar base rates of the Mexican Agreement, were overridden by the force of Administration pressure.

More recently we have entered a strong protest with the State Department against the 30-day period allowed for industries to present facts bearing on proposed reductions in duty, and have asked that at least 90 days be allowed for this purpose.

Of particular concern is an apparent trend of thought towards encouraging importations in order to "conserve" our resources. The "have-not" philosophy seems to have taken considerable hold in high places. Recent publicity on this subject has tended to focus public attention on the importance of minerals to the nation, but has frequently left a distorted impression. Estimates of future reserves are taken too literally, without regard to the potentialities of further development and the past record of the industry in continuously replacing worked-out ore-bodies. The need of maintaining a strong and healthy mining industry, and of providing conditions favorable to its continued growth and development, must be vigorously presented to all who are concerned with national mineral policies and the future security of the United States.

Labor Legislation Proposals for labor legislation have been the subject of much study. The need for amending existing law to provide equal status and equal responsibility on the part of employees and employers is becoming clear. Recognition of productivity as the primary factor in wages is needed. The outcome of present legislative efforts is uncertain, but continued effort must be directed to

balancing the one-sided enactments of the past decade.

The question of whether organizations representing supervisory employees form an appropriate unit for collective bargaining is fundamental to management's right to manage. We have presented strong statements to the National Labor Relations Board on this subject. Recent findings of that Board indicate that amendment of the Wagner Act may be needed, to fix the status of foremen as the representatives and agents of management, and legislation to that end will have our full support.

We have also supported the Gwynne bill, which would limit suits for back pay under the Wage-Hour Act and other Federal statutes to one year—thus affording some protection against excessive liabilities for back pay and overtime wages as a result of changed interpretations of the Act. Similarly, we have opposed legislation which would set an unduly high minimum wage and permit wage rates for all job classifications to be fixed by Government action. At the time of the coal wage controversy, legislation was initiated to outlaw union demands for "participating royalties" on the products of industry.

Tax Legislation

The 1943 Revenue Bill, which was "in the mill" at the time of our last meeting, was ultimately enacted over the President's veto. It carried the amendment of Senator Johnson of Colorado, defining "Gross Income from the Property" for percentage depletion; this protects taxpayers against arbitrary rulings reducing the base on which percentage depletion is computed, and thus denying the full allowance intended by Congress. This Act extended percentage depletion to several additional minerals, including potash, barite and talc. It also granted an exemption from excess profits tax to fluorspar, and to the "excess output" of new coal and iron mines. The exemption from renegotiation accorded to raw mineral products—carrying a corresponding exemption for manufacturers of mining machinery—was continued unabridged.

The 1945 tax law embodied important provisions urged by our Tax Committee. It repealed the excess profits tax, recognized by Secretary Vinson as the greatest single obstacle in our tax structure to enterprise and to the investment of risk capital. Income tax rates, both corporate and individual, were reduced. The capital stock tax and declared-value excess

profits tax were repealed. The 1 per cent payroll tax for Social Security was again "frozen," pending a thorough study by Congress.

Our Tax Committee, under Mr. Fernald's leadership, is continuing its hard-hitting drive to obtain needed amendments to the tax laws and regulations. Conferences with Treasury officials have resulted in new rulings with respect to "Non-taxable bonus income" and "Gross Income from the Property," which provide greater flexibility of application. The committee is giving intensive consideration to the treatment of development expense and to other features of the law which need clarification. A recent study of depreciation allowances has resulted in recommendations which are receiving wide attention, both in other industries to which this problem is important and in official circles.

No adverse change in the percentage depletion provisions has been made, despite repeated attempts by the Treasury in past years. If, as some predict, the attack is renewed next year, a strong defense of this very necessary provision will be required.

St. Lawrence Project

Proponents of the St. Lawrence seaway and power project are again seeking its approval by the Congress. In addition to placing an unwarranted burden upon the taxpayer, the proposed seaway threatens to upset the economy of the Great Lakes Basin, while the power development carries the threat of unemployment and revenue losses in the coal and railroad industries. The project is

close kin to the several "Valley Authority" measures now before the Congress. We have continued our opposition to this unnecessary and ill-advised project.

Stream Pollution

Legislation on this subject has again become active. We are opposing a measure providing drastic Federal controls, and setting up a new agency with power to prohibit the discharge of waste material and thus

to force mining and industrial operations to close down. We have urged that Federal action be limited to studies of the problem and assistance to State and local agencies. We have consistently maintained that water pollution is a local problem, varying widely in nature and extent, and best dealt with by State and local authorities.

Gold Mine Relief

The gold mines, which suffered heavily under the arbitrary shutdown order, L-208, present a special case calling for legislative relief. They were forced to cease operations—not

as an indirect result of the war, through the operation of priorities, manpower ceilings, or OPA regulations—but by direct Government edict. Their property right to continue in business was taken away, with no provision for reimbursement. Our full support is being

given to Representative Engle's bill which would rectify this injustice and make restitution for out-of-pocket losses.

Lifting of Order L-208 was finally accomplished on July 1 of last year, after strong representations had repeatedly been made to the War Production Board.

Silver

During the war silver has proved its usefulness as an industrial as well as a monetary metal. Its market position justifies a substantial further increase in price. Silver fabricators are urging reenactment of the Green bill, which would supply them with Treasury silver at 71.11 cents an ounce, and which was supported by producers as a wartime measure. The industry is strongly opposed to any such legislation, making Government-held stocks available to consumers at less than actual value.

Public Lands

Cause for concern is to be found in the Annual Report of the Secretary of the Interior, in which he suggests that the Bureau of Mines should be enabled to "exercise authority over the use of mineral resources." The report further states that, with the end of the war, "problems awaiting solution include the rejuvenation of our Federal mining laws and the enactment of a general mineral leasing statute."



J. D. Francis
Pres.,
Island Creek Coal Co.



D. A. Callahan
Pres.,
Callahan Cons. Mines Inc.
Vice Presidents American Mining Congress



W. J. Jenkins
Pres.,
Consolidated Coal Co.
Member, A.M.C.
Executive Committee

If this continues to be the Department's policy, the implications of these statements are obvious. They portend renewal of the effort to abrogate our long-established mining laws and to establish close Government control over mineral development through extension of the leasing system. The industry has previously resisted this trend, to which we remain unalterably opposed.

Government Controls

During these two years, controls over materials and equipment for the mining industry and manpower shortages have continued to present difficult problems. We have worked closely with the War Production Board, the War Manpower Commission and the Selective Service System to minimize the difficulties. The ending of hostilities brought a considerable measure of relief although the manpower shortage persists in many areas. I shall not detail the many problems in these fields which called for attention, but will append a report by Mr. McMurrer of our staff,* who has been in direct touch with these matters.

General

Without taking time to discuss in detail other activities of your organization, we might mention a few further matters in which we have had occasion to be of some service. These include:

Clarification of a joint resolution relating to "intangible drilling costs" of oil and gas wells—to avoid implications adverse to mining.

Withholding tax regulations—in respect to occupational deductions for coal miners.

Amortization of war facilities.

Wage and salary stabilization.

"Fringe" wage increases—shift differentials, etc.

"Full Employment" legislation.

Unemployment compensation—opposition to a federalized system and to elimination of merit ratings.

The "Bretton Woods" legislation.

Reduction in gold base for the currency.

Administration of the Surplus Property Act—particularly as to transfers of contract termination inventories to stockpile.

Proposed Government control of fertilizer materials.

Coal prices.

Assessment work requirements.

Exploration appropriations.

Aboriginal claims—Alaskan Indians.

Gold mine "moratorium" legislation.

SEC restrictions.

Access roads and RFC mine loans.

* * *

From an organizational standpoint the past two years have seen steady

progress. Our membership has been expanded in all branches of the industry, and our financial position has been strengthened. Contact has been maintained with mining men throughout the country, and especially with the State and district mining organizations, whose membership extends to the most remote mining communities.

Our Manufacturers Division has continued its valued support. The manufacturers, who have always played an important part in our work for the modernization of mining practices, have in recent years taken increased interest in our work in Washington—both on priorities and in tax and legislative matters which affect them as well as those directly engaged in mining. Plans for resuming our coal and metal mining expositions have been made, and each of these will be placed on a two-year schedule, with the Coal Show and the Metal Mining Show in alternate years. In each case a regular convention without exhibits will be held in the "off" year. Annual dues from members of the Division are being continued on a basis designed to insure against loss of revenue under the two-year schedule.

Our Coal Division committees, in spite of wartime demands upon their time, have made numerous further studies of operating problems. A

summary by Mr. Southward* is appended to this report. This work, looking toward better and safer mining practice and the development of the most efficient types of mining equipment, will be expanded as the industry returns to normal.

Our official publication, MINING CONGRESS JOURNAL, has progressed in editorial and advertising content. Circulation has grown to over 13,000, almost equally divided between the coal mining and the metal and non-metallic mining fields. The JOURNAL affords a valuable means of bringing to the attention of the industry and of the public the latest developments in all fields of mining. In public relations, we shall continue to portray the economic importance of the mining industry, together with mining's special problems which call for public understanding and enlightened consideration at the hands of Government.

May I take this occasion to voice our thanks to the many mining men who have aided our efforts, in Washington matters and other activities. Many of them have spent considerable time in Washington, frequently at personal sacrifice, in the interests of the common cause. To them and to you are due whatever measure of accomplishment these two years have brought.



View north from Victor, Colo., showing Portland mine at the right and Ajax mine on the left

* This report appears in full in March issue of Mining Congress Journal.

Government Controls

By P. D. McMURRER

Materials and Equipment

MINES and mining manufacturers continued to have their full share of problems in materials procurement until the end of the war brought about removal of most Government controls. While the basic importance of the industry had been recognized, the complexities of the supply problem as the war reached its height called for constant attention and we gave all possible assistance to the War Production Board's Mining Division in keeping abreast of the situation.

Early in 1944, Order P-56 was amended to relieve the mines of filing many special application forms, and soon thereafter another change gave the Mining Division full control over all applications submitted by mines. This revision had been strenuously urged by a resolution adopted at the American Mining Congress' Cincinnati meeting early the previous year. Requirements for special applications under various "L" and "M" orders were gradually eliminated, considerably reducing the industry's paper work.

A further change in P-56 established quarterly quotas for maintenance, repairs and operating supplies, based on the corresponding quarters of 1943. This eliminated the necessity of filing itemized applications for such items, the total of which had run to 28,000 annually. Permission to include minor capital additions (up to \$500) in the MRO quota was also given, which further simplified the procedure. Order P-56 remained on the books, assuring the mining industry of top ratings for equipment and materials, until it was revoked on September 30, 1945, in the over-all lifting of priority controls.

Mining continued to enjoy certain specific exemptions under Construction Order L-41; and when the critical lumber situation led to the issuance of the lumber control order, L-335, in March, 1944, mines and smelters were generally exempted from its provisions.

Towards the middle of 1944 the shortage of large, heavy-duty tires, as well as of some special sizes used underground, led to the adoption of a priority system by OPA covering the use of such tires. Through the Mining Division the needs of the industry were made known, with the result that certain critical mining operations were granted highest ratings. Further, the Division did a most commendable job in following through to see that no essential mine

production was lost through lack of tires. As in many other cases of shortages or bottlenecks in procurement, too numerous to be cited here, the full efforts and cooperation of the industry and the Mining Division achieved results.

During the past two years, heavy demands for mining equipment on the part of the United Kingdom and Russia placed additional burdens on mining manufacturers, although every effort was made to meet first the requirements of our domestic mines. The mining machinery scheduling Order L-269 remained in effect until the end of 1945, although an amendment early in 1944 had relieved manufacturers of the necessity of filing monthly production and delivery schedules as to some 40 types of equipment. Many additional exemptions were granted up to the time when WPB's system of priority ratings and allotments was finally dropped. Formal programming of the production of critical underground coal mining machinery was continued throughout 1944 and 1945.

Manufacturers had considerable difficulty in securing certain materials and components despite the fact that late in 1943 the mines were authorized to use AA-1 ratings. By that time the manufacturers' inventory positions were bad, and the lag in getting deliveries, even with top ratings, precluded their catching up. Last summer's program for a 50 per cent increase in the production of underground coal mining machinery for the last quarter added to their difficulties considerably, even though AAA ratings and directions were issued by WPB to aid this effort to boost coal production.

The impending end of the war added some confusion to the materials and equipment supply situation as WPB issued, revised, and revised again its reconversion program. However, the various WPB regulations were gradually revoked, CMP was "open-ended" in midyear and eliminated, together with the AAA priority system, at the end of September, 1945. The functions of the War Production Board were terminated on November 3, 1945, and all remaining activities were transferred to the Civilian Production Administration. Certain basic controls such as inventory regulations were consolidated, provisions were established for special priority ratings to break reconversion and production bottlenecks, and the end of the period found industry in large measure out from under Government controls on materials and equipment.

Little relief was granted the gold mines until the revocation of Order L-208 on June 30, 1945. Repeated efforts to secure the revocation of this order, including strong presentations to WPB by the American Mining Congress, failed to elicit much consideration for this harassed industry, although WPB had issued some grants authorizing priority assistance on maintenance and repairs, and had announced slight relaxations on machinery and equipment for rehabilitation of gold mines in preparing for the revocation of the order. L-208 remains a black mark on WPB's record.

Manpower

The manpower problem was one of the most debated issues of the past two years and the mining industry had an uphill fight all the way to maintain required levels of production. Working forces were heavily depleted by draft calls and by loss of men to war industries, and efforts at replacement were of little avail. The deferment directives of Selective Service, previously prepared in conference with our office, remained as a base for consideration of occupational deferment in the mining industry by local boards, even after changes in draft procedures nullified their original application.

Debate in Congress over national service legislation was renewed early in 1944 following the President's recommendation for such legislation. The President's request of January, 1945, for total mobilization, calling for limited service by all men 18 to 45 years of age, was supported by Army, Navy and administrative agencies, and opposed by industry, labor and farm groups. Passed by the House after a stiff fight, particularly over what agency would be given control of manpower, it was rejected by the Senate, which formulated and passed its own version of a service bill. The House measure, backed by regular draft-dodger penalties of Selective Service, aimed to "freeze" men 18 to 45 years of age in war jobs or in agriculture, and permitted Selective Service local boards to call up men in this group for war industries. The Senate measure, giving statutory authority to the War Manpower Commission, permitted imposition of employment ceilings and controls, and provided penalties against employers violating WMC regulations. House and Senate conferees submitted a compromise measure which was rejected by the Senate and finally tabled in the House Military Affairs Committee. It is questionable whether there was any real desire for passage of this legislation or whether the threat of it was merely being used as a club to bolster manpower controls.

Selective Service draft policies varied considerably during this period and both employers and employees were generally kept "up in the air." With the approaching climax of the war, the military services demanded more and more young men and Selective Service exerted every pressure on draft boards to meet their quotas. Consequently, the favorable consideration of mine workers for deferment, which had been widely established and in some cases specifically directed by Selective Service, was largely nullified by the tightening up on draft boards to produce young men for the armed services.

The manpower squeeze was directed at men under 26 years of age, and finally State draft quotas were adjusted so that all this young group would be called at one time. Pressure was kept on the older groups, as well as on 4-F's and limited service men, to meet the requirements of essential industries. In recognition of the critical coal supply situation, Selective Service set up a program, in conjunction with the Solid Fuels Administration, whereby special deferments were granted to a limited number of experienced coal miners. The demand for additional coal mine manpower continued, but requests for release of sufficient miners from the Army to meet production requirements were turned down.

The drain of young men from industry reached such a point in February, 1945, that a new draft deferment program was announced to protect a vital "hard core" of young workers in war production. Industry surveys were made of occupationally deferred men in the age group 18 through 29, and 15 Government agencies were authorized to certify up to 30 per cent of such workers to local draft boards for deferment. Later on, the quotas for a few industries, including coal and non-ferrous mining, were increased to permit the deferment of more irreplaceable young workers.

After V-E Day, WMC allowed area officials in conjunction with area labor-management committees to retain, modify or reapply manpower controls in conformity with local conditions. Upon the President's announcement of the Japanese surrender, all manpower controls over employees and employers were abolished and a free labor market was officially resumed. Selective Service immediately stopped taking men over 26 years of age and draft quotas were revised.

Throughout the entire period of manpower shortages and ever-changing Government controls, the American Mining Congress has been active in conferring with the wartime agencies on the mining industry's problems, and in keeping the industry fully informed of all manpower regulations and their frequent revisions.

Activities of Coal Division Committees

By G. B. SOUTHWARD

THE Coal Division, in spite of many difficulties resulting from the war, continued its activities during the past two years and maintained its schedule for studies and reports on mine operating problems. A high degree of cooperation was given to the committees, both by the individual members and their companies; although working under high pressure on their jobs, these men found time to gather data for the studies and to attend meetings to approve the reports and plan new projects. The number of such meetings was, of course, reduced to a minimum and the Annual Conference of the Coal Division, customarily held in Pittsburgh in December to review the past year's progress, was not held in 1945.

The committees, in common with the mining industry, lost a number of men to the armed services but through the assistance of our member companies, replacements were secured. A total of 169 men—118 coal operators and 51 manufacturers—are now serving on the following 10 committees: Safety, Haulage, Power, Mechanical Loading, Surface Preparation, Conveyor Mining, Dust Abatement, Roof Action, Ventilation and Stream Clarification.

The function of the committees is to keep the coal industry informed on current mining developments and indicated trends. This purpose guides the selection of the subjects taken for study, the type of data compiled and the manner in which the reports are prepared. After completion and approval, the reports are presented to the industry by publication in MINING CONGRESS JOURNAL, and by reprints which are circulated to the many operators and manufacturers who have requested this service. A wide range

of mining problems is covered as indicated by the following partial list of recent publications:

Splicing Mining Cables with Synthetic Rubber Insulation—methods of repairing electric cables having various types of synthetic rubber covering.

Recovery of Fuel Values from Rejects—reclaiming merchantable coal from waste disposal of mines and washers.

Shuttle Car Loading for Belt Conveyors—intermediate devices between shuttle and belt to reduce belt wear and spillage loss.

Mine Roof Sealing to Prevent Slate Falls—experimental applications of waterproofing to top rock to prevent deterioration caused by air and moisture.

Mine Haulage with Locomotives and Track—costs for installation and operation of mine car transportation.

Underground Belt Haulage—operating and installation costs of mine transportation with belt conveyors.

Education to Reduce Mining Accidents—safety instructions for mine officials and employees.

Maintenance Organization and Practices—accounts of plans and methods used by a number of representative companies.

Training Mine Electricians and Mechanics—increasing the performance efficiency of equipment by education of the repair crews.

Measuring and Mapping Mine Ventilation—reducing ventilation losses and balancing the air circuits.

Suppression of Coal Dust Underground—installation and operating costs for various types of water sprinkling systems.

Service Haulage for Mobile Loading Machines—methods with mine cars, shuttles and conveyors.



A congenial gathering at the buffet supper during the 48th annual meeting of the American Mining Congress



A DECLARATION OF POLICY



The AMERICAN MINING CONGRESS

assembled in Annual Meeting, Washington, D. C.

February 13, 1946

declares its views upon the following matters of public policy:



THE WAR IS ENDED, but the effect of war remains. Social and economic wounds must be healed and the constructive ability of a free people mobilized for a restoration of the life we once knew.

The mining industry gave its best for the winning of the war. Now the task is to prove that a democracy can restore orderly processes and reestablish peace and happiness upon the ruins made by war.

The mining industry has used up reserves of metals and minerals which would not have been produced for normal consumption over a period of many years. Its program of development was curtailed and in many cases entirely abandoned in order to give full play to production.

But the mining industry is ready to start anew upon a program of exploration and development. Our mineral resources have not been used up nor are they in danger of early exhaustion, despite the gloomy forecasts of certain people in high places. The men best qualified to know, by training and first-hand experience, say most emphatically "this is not a 'have not' nation so far as metals and minerals are concerned—nor is it likely to become such."

The mining industry believes that with faith and courage we can repeat the accomplishments of the pioneers in mineral development, production and beneficiation.

The need for the products of the mines never was greater. The better world to live in is dependent upon the ability of the mining and metal industries to supply the raw materials for the machines and appliances which are demanded. The preservation of peace is tied up with our ability to maintain the production of the machines to prevent war.

On this threshold of a postwar world the mining industry asks for full and complete cooperation of government, labor and capital in the restoration of depleted ore reserves; in labor and management

relations which will eliminate waste and delay; in government encouragement to development programs; in capital's willingness to take a chance in seeking new sources of metals and minerals. Granted these we have an abounding faith in our ability to produce the mineral raw materials with which nature has so blessed this land of ours.

LABOR RELATIONS

Wartime concessions of greatly increased rates of pay and of other wage-increasing devices cannot be maintained without greater productivity on the part of labor. We favor high wages provided they are earned by increased efficiency.

Federal and State legislation should penalize labor unions which countenance limitations of output, slowdowns, or make-work, featherbedding or other monopolistic practices.

We restate our belief in collective bargaining, properly conducted. The sole function of government in labor disputes should be to act as an impartial conciliator. We believe that the strike or lockout weapon should not be invoked until both parties have exhausted genuine direct negotiations and conciliation.

We do not believe in compulsory arbitration. Neither do we believe in so-called fact-finding by government agencies, nor in intervention by the government in favor of either side to a labor dispute.

All collective bargaining agreements should contain clauses prohibiting strikes and lock-outs during the period of the agreement, and should provide for machinery to settle disputes peacefully. Legislation should encourage but not compel such agreements.

All collective bargaining agreements should, by law, be mutually and equally binding and enforceable against each of the parties thereto. Unions, parties to collective bargaining agreements, should

be responsible for their obligations on their behalf and for breach thereof should be suable in State and Federal courts in the union name.

We are opposed as a matter of principle to the closed shop and to "maintenance of membership." We believe that all men should have the right to work regardless of union affiliation or lack thereof. The proviso in the National Labor Relations Act sanctioning closed shop agreements should be repealed. Pending such repeal, unions having closed shop agreements should be required by law to open membership on reasonable terms to all persons hired by the employer.

The Wage-Hour law should be amended to permit parties to collective bargaining agreements to define "work time" for the purposes of applying the minimum wage and maximum hour provisions. Employees working under a collective bargaining agreement providing for minimum wages higher than the legal minimum should be exempt from the minimum wage and maximum hour provisions.

Employers should be forbidden by law to pay money to unions for any purpose unless the money is deducted from the pay of union members.

Violence and intimidation in connection with organization of unions or in connection with labor disputes should be prohibited by Federal and State law.

Unions should be required by law to meet definite minimum standards of internal democratic procedure in electing officers, in levying fines, spending money, publishing financial reports, and calling strikes.

Unions should be subjected to the same restraints to which corporations are subject in spending money for political purposes.

Unions should again be made subject to the Federal anti-trust laws. Sympathy strikes, jurisdictional strikes against duly certified and recognized unions functioning under unexpired collective bargaining agreements, strikes to accomplish unlawful or illegitimate aims, strikes to accomplish lawful ends by unlawful means, and secondary boycotts should be made unlawful.

RIGHTS OF MANAGEMENT

Management must retain the right to manage. The functions of management must not be impaired by union organization of supervisors or by any other device.

The Congress should definitely declare that supervisory, professional and confidential employees are not "employees" within the meaning of the National Labor Relations Act.

DAMAGE CLAIMS UNDER FEDERAL STATUTES

We urge prompt passage of legislation limiting to one year the time for bringing civil suit to collect damages and penalties arising under the Wage-Hour law and other Federal statutes.

TARIFF

To protect our nation against future threats to its security and to permit continuation of a basic industry essential to the economy of the country, the mining industry must be kept in an active and healthy operating condition and new exploration and development of future reserves must be encouraged. Adequate tariff policies must protect the domestic mining industry against competition of richer natural deposits, lower labor costs, exchange regulations and the operation of cartels in foreign countries.

STOCKPILES

We endorse the creation of permanent stockpiles of strategic minerals and metals to be held exclusively for purposes of National Defense. Materials in these stockpiles should not be released for any other purpose without the express approval of Congress. We urge that such legislation be passed immediately.

PRICE CONTROLS

We favor the prompt removal of price controls on metals and minerals and the return to a free market. To the extent that excess production beyond that afforded under free market conditions is required for national defense or in the interest of the national economy, certain mineralized areas, from which substantial production is available, may require special assistance.

PUBLIC LAND POLICY

We hold that the public interest will best be served by maintaining the long established policy of fostering domestic mineral production by private enterprise on the public domain, thereby promoting exploration that will lead to mineral discovery and thus strengthen the position of this Nation to meet future needs. To this end, we oppose any attempt to nationalize the mines of this country, or to extend the government leasing system to cover lands valuable for those metals and minerals which for nearly a century past have been subject to laws authorizing the location and patent of claims.

We likewise oppose expansion of the mineral leasing system by executive order or regulation under which (a) Government seizure or compelled

sale for Federal use or distribution of all or part of the production from leased lands over and above royalties in kind would be authorized; or (b) exploration by private enterprise for minerals subject to the leasing system would be prohibited or restricted.

We advocate amendment of statutes governing creation and extension of Indian reservations on the public domain, including Alaska, to require that all Federal mining laws be continued in full force and effect on lands hereafter set aside for such reservations. We advocate immediate review by Congress of reservations established by executive order in the past ten years, followed by legislation reducing their areas to reasonable present and future needs of the Indian populations therein and restoring eliminated territory to exploration for metals and minerals.

We recommend that all military reservations not needed for permanent defense of our country be returned to the public domain and reopened to exploration under the existing mining laws.

PRIMARY MINE FINANCING

The financing of primary mining ventures must be recognized as an essential element in the future safety and prosperity of the Nation. Such financing must not be subject to the whim and caprice of governmental agencies but must be freely permitted with checks only to prevent fraud.

WATER POLLUTION

Water pollution is a local problem, varying widely in nature and extent, and best dealt with by State and local agencies, supplemented where necessary by interstate compacts. We oppose legislation vesting control over water pollution in a Federal agency with power to set rigid standards and to force compliance through action in the Federal courts.

ST. LAWRENCE PROJECT

We oppose as needless and unjustifiable the proposed Great Lakes-St. Lawrence deep waterway and power project. The enormous ultimate cost, not at first apparent, would impose large tax burdens; the waterway would be of principal benefit to foreign products and shipping; the water power would merely displace more economical steam-generated power.

The project would disrupt great mining and metallurgical industries and other essential enterprises of the Great Lakes basin, where successful productive activities of a vast population are vital to the welfare and self-sufficiency of our country.

GOLD MINE RELIEF

We advocate legislation to reimburse gold mine owners and operators for capital losses and unreimbursed maintenance costs sustained under Limitation Order L-208. Injury to the gold mines constitutes a unique case, resulting not from the indirect effects of priorities, manpower ceilings or price regulations, but from a direct War Production Board edict forcing the mines to cease operations.

We recommend Congressional expansion of the authority of the RFC to specifically authorize loans in amounts sufficient to provide for the rehabilitation of gold mining properties which were wholly or partially closed down through operation of Order L-208, and which contain proven ore bodies of value sufficient to repay the loans.

MONETARY POLICY

We continue to favor a currency with a metallic base, using gold and silver. We endorse the continued purchase and coinage of domestic gold and silver, as provided by law. We urge the repeal of the prohibitions on free circulation of gold, and the removal of the ceiling price on silver, and we oppose enactment of legislation designed to authorize the sale of Treasury silver at less than its lawful monetary value.

TAXATION

1. We commend the statement which Treasury Secretary Vinson has made (before the Ways and Means Committee, October 1, 1945) as to the first principle which should guide in constructing a tax program—

"Taxes should be levied in such a way that they have the least harmful effect on the expansion of business investment and the creation of jobs, because productive employment is the source of our standard of living, of all income, and of the revenue which the government collects from taxes."

We commend as important progress towards this standard the action of Congress in repealing the excess profits tax and the capital stock tax and the reductions made in other taxes to relieve the tax load on business and investment. We urge that further needed steps be taken promptly to create adequate incentive for investment, for business activity, and for employment.

2. Among the features which should be embraced in that tax revision are the following:

Corporate income tax rates should be further reduced; and the higher individual surtax rates should be reduced to a point at which they will not, as at present, exceed the point of maximum productivity.

Dividends should be taxed to individuals only to the extent that the individual's tax rate on the earnings involved exceeds the corporate tax rate. Intercorporate dividends should not be taxed. Individual income should in no event be subjected to an overall tax rate exceeding 50 percent, after allowance for corporate taxes paid on earnings represented by dividends.

3. In determining taxable gain, full allowance must be made for capital recovery. Losses of loss years should be fully deductible in determining the income of years subjected to tax. Carry-back and carry-forward losses should be computed in a manner which will eliminate discrimination. Corporations which over a period of years have loss years interspersed with profitable years should not be subjected to heavier tax burdens than those corporations having similar aggregate income evenly distributed over the same period without years of loss. Particularly, there should be no discrimination against percentage and discovery depletion allowances. The taxpayer should be given every reasonable latitude as to amount and method of computing reasonable allowances for depletion and depreciation, and the tax benefit principle should be applied so that amounts will be considered as theretofore allowed only to the extent they resulted in a tax benefit to the taxpayer, or allowable to the extent they might have given a tax benefit. Costs of development, exploration and research should be allowed as part of the operating expenses of mines.

4. The law should be framed and administered to safeguard the interest of taxpayers as much as to obtain revenue for the government. There should be a real endeavor to have law and regulations, in substance and in expression, such that they can be reasonably understood by taxpayers. The administration of the law should be such as to carry out the Congressional intent, and should not be distorted by regulation or otherwise to deny to the taxpayer rights recognized by Congress. The Congressional intent as expressed in committee reports should guide the administrative officers.

Taxable net income should be brought as nearly as practicable to the standard of net income as ordinarily understood, with time and nature of income accruals conforming as nearly as practicable to good accounting practice. Every effort should be made to place the law on such a basis that standards for determining taxable income will be made stable for a considerable period of years.

5. The excise tax on freight which was adopted as a war revenue measure should be promptly repealed. It is a particularly burdensome cost on the mining industry.

6. While the excess profits tax has been repealed as to the future, there are points regarding it which should have consideration as to years subject to it. Particularly, the relief provisions of Section 722 have bogged down and become of doubtful effectiveness. The law requires amendment to make these provisions effective unless that can otherwise be done through modification of Treasury interpretations.

7. The social security tax rate of one percent should be retained at the present level until the Congress has completed its study of the social security system. The rate should then be fixed at the lowest level required to defray the essential costs of the system.

8. The rate of taxation is affected by the rate of governmental expenditures. Every effort should be made to reduce governmental expenditures so that tax collections will not take a disproportionately large part of the national income.

FREE ENTERPRISE

Free, private, competitive enterprise—by whatever name it is called—is the basis of the American way of life. It has brought to America the world's maximum production and highest standard of living.

Free, private, competitive enterprise requires:

The highest degree of personal freedom attainable under just laws impartially enforced.

Preservation of the incentive system.

Freedom to save and invest as we wish.

No arbitrary control by government.

The preservation of property rights.

Private, not government ownership.

No special privileges—for management, for labor, for capital.

Government by law and not by bureaucracy.

Adequate judicial review of findings of fact and law by Government regulatory agencies.

Retention of the sound principles voiced by the Declaration of Independence and the Constitution including the Bill of Rights.

No war economy now that the war is over.

The acceptance of competition for ourselves as well as for others.

Under this system—to which we wholeheartedly subscribe—American Industry, once the problems of conversion are fairly solved, can move forward with confidence, develop new frontiers through technical and scientific progress, and produce and distribute better goods in greater volume at lower prices to more people.

Only under a system of free, private, competitive enterprise can we restore and preserve individual freedom.

Coal Dust Suppression by Water Infusion

Methods Used in England and Australia Follow Entirely Different Techniques and Are Applied to Different Types of Mining Systems But Both Are Effective in Reducing the Formation of Coal Dust Underground

★ ★ ★ ★ ★ ★ ★ ★

Dust Abatement on Longwall Faces*

THERE ARE three principal methods of dust suppression used at present on the coalface, namely, wet cutting, hand spraying and water infusion. On coalfaces which are machine cut, the most effective means of dust suppression is by water sprays on the coal cutting chain; where the coal is not machine cut, the two methods commonly used are water infusion and hand spraying. The present report deals with dust suppression by means of water infusion, which consists of boring holes in the coal seam and injecting water under pressure so as to damp the dust which occurs in the slips, cracks, and induced breaks in the seam.

The success of water infusion depends upon a number of variable factors and before a system is installed, a plan of operation must be devised for each face based on preliminary tests embodying each of these variables. Most of the failures which occur are due to a lack of appreciation of the factors discussed in this report.

Factors Influencing the Effectiveness of Water Infusion

Location of the boreholes in the seam will depend upon the nature of the coal, roof, and floor and the presence or absence of dirt bands in the seam. The drills should be positioned so as to keep the water away from the rock bed most readily affected by water, where such a bed forms either the roof or the floor of the seam. The tendency to flow towards the floor due to gravity must be borne in mind in this connection. If a dirt band occurs

in the seam it may form a water barrier and advantage can often be taken of this to retain the water in that part of the seam remote from the sensitive bed.

Distance apart of the boreholes can only be decided upon after tests have been carried out on the face in question, but should be such that the length of face treated by one hole will just overlap that treated by the adjacent holes. In practice it ranges from 6 to 15 yds., but if the pressure is to be kept within reasonable limits it should not be much greater than 6 yds., due to the difficulty in getting the water to spread for more than 3 to 4 yds. either side of the hole.

Depth of the boreholes should depend upon the rate of advance of the face, and too long a period should not elapse between successive infusions or the effect of evaporation becomes appreciable. On conveyor faces experience has shown that satisfactory results may be obtained with holes bored to a depth of 6 in. greater than the width of the conveyor track. It is doubtful if there is much advantage to be gained by the use of deep holes since the slips do not open and the breaks are in general, not developed ahead of the free face of the coal to such an extent as to permit the water to flow readily unless excessively high pressures are used.

Pressure of the water used for infusion should be as low as possible due to the disruptive action of water at high pressure. It will, however, have to be high enough to overcome the resistance of the slips and breaks through which the water has to flow, and in some cases where the slips are "tight," very high pressures have had

to be used. One of the dangers found to arise from high pressure is that resulting from the penetration of the water into breaks in the roof and floor of the seam; this may be unknown at the time and is not apparent until later when probably much damage will have been done.

Quantity of water is a factor of great importance and needs closer control than any other; a flow meter therefore is absolutely essential and should form part of the normal equipment of a sealing unit. Instances have been recorded of 1,000, 1,400, 1,800 and 3,000 gallons of water being injected into single holes; the consequence was in many cases disastrous upon the roof and floor of the working places, and water infusion was often wrongly condemned. As a result of experience, it is recommended that a specified quantity of water be injected into each hole, which can only be determined by tests carried out on the actual face being infused. Satisfactory results can usually be obtained by the application of about 1½ gallons of water per ton of coal treated. Thus, on a face 100 yds. long in a seam 4½ ft. thick, infused to a depth of 6 ft., the quantity of water required would generally be 450 gallons, or about 26 gallons per hole, provided the holes are spaced at intervals of 6 yds. apart.

Rate of flow of the water into the hole should be the minimum compatible with the time necessary to complete the infusion of the face under treatment. This is desirable because thereby the water has the best chance of penetrating the slips, cracks and fissures in the coal. A rate of flow which can be recommended is 1½ to 2 gallons per minute, although it may be found possible in some cases to obtain satisfactory results at a slightly greater rate of flow.

* Extract of report by the Coal Dust Committee of the Monmouthshire & South Wales Coal Owners' Association.

Single Versus Multiple Infusion

Simultaneous infusion of up to six holes at a time is being practiced at some collieries; it is doubtful, however, if the results from the dust suppression standpoint are satisfactory due to the fact that the resistance of adjacent boreholes in the coal seam to the flow of water will not be constant. An experiment on simultaneous infusion was carried out with four holes; the water was applied simultaneously at 185-lb.-sq.-in. pressure over a period of half an hour and the rate of flow into the four holes was found to be 3.3, 5.7, 1.0 and 0.0 gallons per minute, respectively. After this test, the fourth hole was connected

separately and it was found necessary to increase the pressure to 230 lbs. per sq. in. before the water commenced to flow.

Wetting Agents

Certain coals cannot be infused with water at low pressure, and in some cases it has been found that the pressure required was so high as to render the application dangerous and difficult, or even impossible. It was essential, therefore, to devise some means of infusing at low pressures and it was decided to experiment with the addition of oil to the water in order to reduce the resistance of the coal to the flow of water. From these experiments the following conclusions were drawn:

The addition of oil to the water used for infusion makes the treatment more lasting in its effects. For this reason it is strongly recommended for use on slowly moving faces. The use of an oil-water emulsion enables the infusion to be done at a much lower pressure than is the case when water alone is used. It is thus likely to confer great benefits in cases where it is desired to maintain the pressure at a minimum due to the adverse effect of water at high pressure in penetrating the roof and floor of the seam. A higher efficiency of dust suppression can be obtained by the use of an oil-water emulsion than by the use of even larger quantities of water.

Dust Abatement in Pillar Workings*

COAL DUST associated with the extraction of pillars in the mines of New South Wales, Australia, has been one of the major problems of the industry for many years. The mining is by hand loading in the room and pillar system, with many pillars standing for periods of 15 to 20 years before extraction; as a result the coal becomes crushed and the dust problem is accordingly aggravated. External application of water at the face by hose did not prove satisfactory and obviously some other means of dealing with the dust had to be introduced.

Our conditions appeared somewhat comparable to the longwall workings in England which had been successfully treated by water infusion and we therefore began experiments with

water infusion at low pressures at the Coal Cliff Mine in New South Wales, Australia, about the middle of 1944. In the test area the seam was about 7 ft. high, coal pillars 60 yds. by 50 yds. had been formed about 12 years before and the results of our experiments are summarized in the following paragraphs.

Report of Tests In Pillars

Size of holes. The maximum length bored was 160 ft.; the diameters varied from $2\frac{1}{4}$ in., $2\frac{1}{2}$ in. and 1 $\frac{1}{2}$ in. In a test boring 160 ft. in length and $2\frac{1}{2}$ in. in diameter, water was applied at 35 to 40 p.s.i.; initial absorption was at the rate of three gallons per minute, falling to two gallons per minute after two hours infusion, the rate of infusion generally diminishing until 3,500 gallons of water had been absorbed in 48 hours.

Spacing of holes. Holes were bored in full size pillars 60 yds. by 50 yds., parallel to the major axis; the pillar is then mined by a 6 yd. wide "split" driven up the center along the shorter axis, cutting the boreholes put in ahead at right angles to the split. With pressures ranging from 35 to 40 p.s.i., water saturated the coal facings for a distance of 12 to 15 yards on either side of the hole and along its full length from point of sealing, within 48 hours after initial water pressure was applied. This gave an effective area of treatment of 25 to 30 yds. wide and two full length holes were found to be sufficient to ensure treatment throughout a pillar 60 yds. x 50 yds.

Direction of Drilling. The hole should be bored to cut across and not parallel to the facings of cleavages in the coal. In the seam at Coal Cliff the cleavages are well defined and run somewhat diagonally across the

(Continued on page 77)

* Extract of report by R. P. Jack, Commonwealth Coal Commissioner, Commonwealth of Australia.



Hose sprinkling was not effective in Australian pillar work

OUR MINE A PROVING GROUND

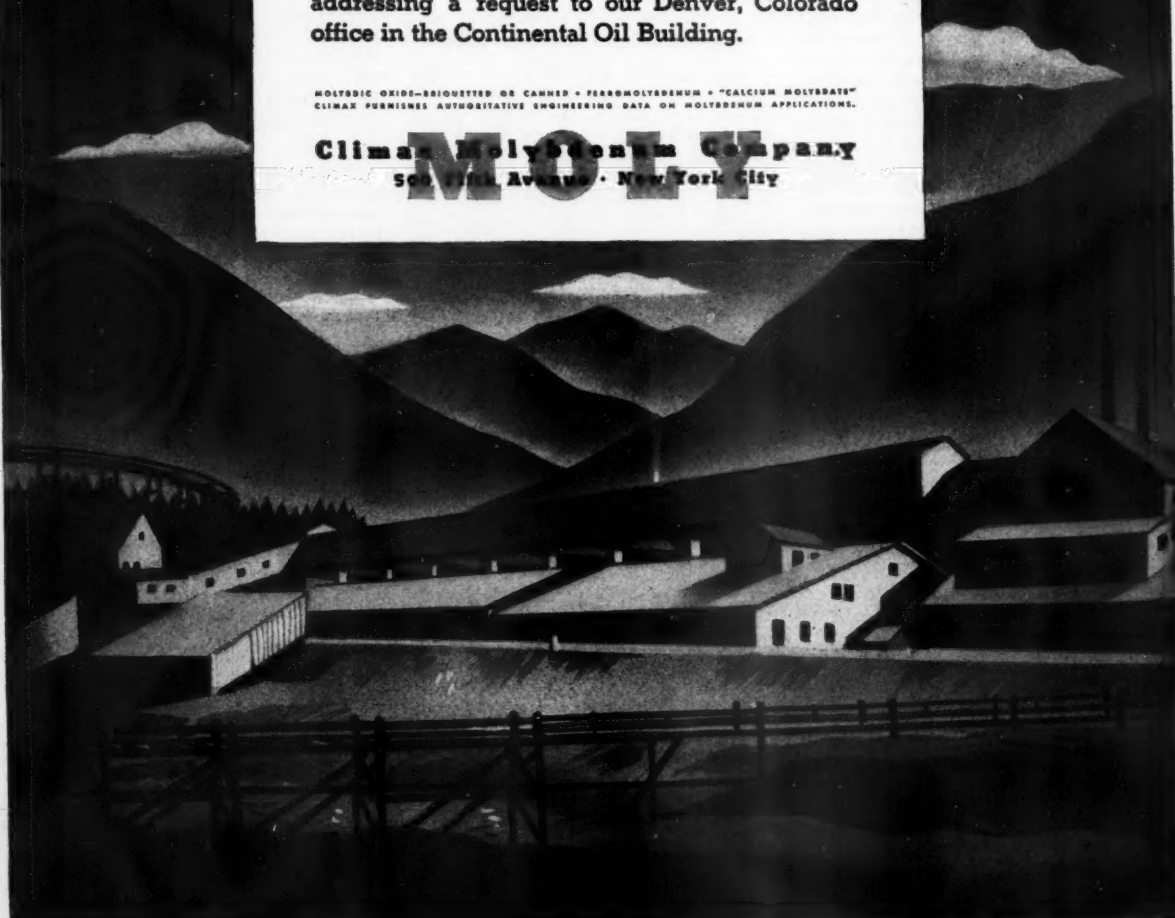
The mine staff of the Climax Molybdenum Company has conducted a research program on wear resistant steels involving the milling of millions of tons of ore. A resident alloy steel metallurgist, with the assistance of our Detroit Research Laboratory, has made available at the mine the broad experience of the Climax technical organization regarding the composition, heat treatment and structure of the steels tested.

These tests have already established the value of molybdenum steels for many applications. Our research program continues for still further improvement.

The results of these tests have proved valuable to other mine operators. You can obtain information which may lower your operating costs, by addressing a request to our Denver, Colorado office in the Continental Oil Building.

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WHEELS OF GOVERNMENT

As viewed by A. W. DICKINSON of the American Mining Congress

BACK on the track after the 22-day filibuster, terminated by withdrawal of the Fair Employment Practices Commission bill, the gears of Congress are meshing smoothly again. The main objective now is to grind out the departmental supply bills in preparation for a long campaign recess, beginning the latter part of June. Chief issue expected to bring out prolonged debate in both the Senate and House is the \$4 billion loan to Britain, now in process of hearings before the Senate Committee on Banking and Currency.

Wages and Prices—Strikes

Promulgated on February 14, an Executive Order carrying the new wage-price formula brought an end to the steel strike and in theory paved the way for wage adjustments in other industries. The Order directs the Price Administrator to adjust price ceilings "in any case in which he finds that an industry is in a position of hardship as a consequence of an approved increase in wages or salaries." Thus the six-months' test period previously required is eliminated. The Order calls upon OPA to make price increases sufficient in size to meet the increased wage rates and to retain a rate of profit, based on net worth, similar to the pre-war period.

Government approval of wage increases is also provided for, where (a) consistent with the general pattern of wage or salary adjustments established in the industry or local labor market area between August 18, 1945, and February 14, 1946; (b) necessary to eliminate gross inequities as between related industries, plants or job classifications where no general pattern exists; (c) needed to correct sub-standards of living; or (d) required to correct disparities between the increase in wage or salary rates since January, 1941, and the increase in the cost of living between January, 1941, and September, 1945. The war-

time Office of Economic Stabilization is re-established under Chester Bowles as Director, and his successor as OPA Administrator is the former Federal Communications chief, Paul A. Porter.

A series of "clarifying" orders implementing the new wage-price formula were issued by the Stabilization Director February 21. The orders would (1) defer until March 15 the requirement that wage increases in large plants must have prior approval of the Government; (2) permit organizations with less than eight employees to grant wage increases without Government approval; (3) exempt from the requirement that prior approval must be obtained, certain "fringe" types of wage increases, such as night shift differentials, vacation and holiday pay; (4) authorize the National Wage Stabilization Board to issue general orders giving prior approval to wage increases in specified industries or areas, which are not higher than amounts determined by the Board to be "an approvable general pattern" of wages; and (5) give pre-approval to increases not exceeding 18½ cents an hour over V-J Day rates in basic steel plants, iron ore mining operations and to service plants in the steel processing or fabricating industry. Automatic approval was also ordered, for price relief purposes, of all wage increases made before the wage-price formula was announced.

Unfortunately the trend of events is indicating that the new wage-price policy is not going to prove the remedy for the increasing number of strikes. Following closely on the wage-price announcement UMWA John Lewis has arranged with the bituminous coal operators to meet March 12 for the negotiation of a new contract. The operators have put Lewis on notice that any wage rise must be accompanied by a price increase, which is bound to affect everyone con-

Washington Highlights

CONGRESS—Eyes early recess for campaign.

WAGE-PRICE—Administration policy is not solution.

LABOR—Case anti-strike bill hits rough going.

MINIMUM WAGE—Senate battle pending on 65-cent minimum.

TAX—Hope fades for general revenue bill.

SOCIAL SECURITY—House committee cool toward revision.

OPA—Extension for one year anticipated.

PREMIUM PRICE PLAN—Congress expected to extend.

STOCKPILING—House Military Committee holds S. 752.

ST. LAWRENCE SEAWAY—Hearings concluded.

SECRETARY OF INTERIOR—Julius A. Krug replaces Ickes.

RADIO-ACTIVE MINERALS—New Order clarifies status.

ASSESSMENT WORK—Not necessary before July 1, 1947.

ected with the coal industry in its competition with oil, gas and water power.

Case Bill

Following House approval 258-155, the Case bill, H. R. 4908, discussed last month, was the subject of hearings before the Senate Committee on Education and Labor, February 19 to 27. The committee refused to endorse the bill and a seven-man subcommittee is now engaged in drafting a rewritten strike control measure. Case bill advocates in both Senate and House realize that the going is tough and are girding up for a real struggle on the Senate floor and in the conference.

Strong endorsement for the measure came from representatives of farm groups. Urging enactment of the Case bill, Farm Bureau Federation President Edward O'Neal, asserted

that labor and industry "have no right to engage in a free fight at the expense of the rest of us." Testifying for the Southern Coal Producers Association, former Senator Edward R. Burke stressed the provision denying recognition under the Wagner Act to unions of foremen and other supervisory employees who do not perform manual productive labor. Recalling that he was serving in the Senate when the Wagner Act passed, Burke stated positively that during the consideration of that measure, neither its sponsors nor other members of the Senate had any intention that the term "employee" as used in the Act should mean anything but "worker" and that the term was never intended to apply to supervisors.

Emphasizing to the committee that management must retain its right to manage, the American Mining Congress called for specific recognition in the statute that supervisors are an integral part of management and are not to be considered as "employees" for purposes of the National Labor Relations Act. Also urged by the Mining Congress were the Case bill provisions making collective bargaining contracts equally binding and enforceable on both parties; outlawing force and violence; and denying protection of existing labor laws to those engaged in boycotts as a weapon in jurisdictional disputes.

Minimum Wage

As finally reported to the Senate March 5 by the Senate Committee on Education and Labor, the Pepper Minimum Wage bill, S. 1349, would increase the minimum wage from 40 cents to 65 cents an hour, increasing to 70 cents after two years and 75 cents two years later. The measure would also extend coverage of the Fair Labor Standards Act to all activities "affecting commerce," which are defined to include "any activities in commerce or necessary to commerce, or competing with any activity in commerce." It would limit suits for back pay to two years with permission to bring accrued claims at any time within two years. Stricken from the bill is the grant of power to the Administrator to fix wage differentials between "interrelated job classifications."

Definite opposition is forming in both the Senate and House to the 65-cent minimum provision. Southern Democrats will wage a determined battle to hold the minimum at not to exceed 55 cents with possibly an additional 5-cent increase after 18 months.

A recent Supreme Court ruling (Roland Electrical Company v. Walling) states that workers, whose jobs are necessary to the production of goods that will go into interstate

commerce, are covered by the Wage-Hour Act, even though the employer is not directly engaged in interstate commerce. This is a drastic expansion of the coverage of the Act.

Tax—Social Security

Doubt that there will be any reduction in the war-time excise rates on luxury items has been expressed by both Chairman Doughton, of the Ways and Means Committee, and Chairman George, of the Finance Committee. The President and Treasury Secretary Vinson have recommended that these rates be continued as at present. There is a growing feeling that consideration of the Social Security law and of the status of the non-taxpaying groups (cooperatives, etc.), coupled with an early adjournment of the Congress, may preclude consideration of a revenue bill until early in 1947.

Ways and Means Committee hearings on Social Security began February 25 and are continuing. Chairman Altmeyer, of the Social Security Board, has recommended more liberal unemployment compensation benefits; inauguration of medical care and disability insurance plans; expansion of the old-age and survivors' insurance to cover agricultural, domestic, governmental and non-profit organization employees; an increase in retirement payments; and credit for social security purposes for time served by veterans in the armed forces. With respect to the payroll tax for old-age benefits, Altmeyer has recommended changing the wage basis to \$3,600 from \$3,000 a year; increasing minimum benefit payment of \$10 a month, and maximum payment of \$85 a month; providing for permanent total disability insurance in the Federal system; and including agricultural workers and self-employed in the coverage. His proposal would bring an additional 21 million persons under the Act.

The attitude of Ways and Means Committee members indicates that there may be no change in the Act except as to future rates of the pay roll tax, it being considered quite likely that this will be frozen for another three years at 1 per cent each on employer and employee.

OPA—Rationing

Atmosphere of the hearings under way since February 7 on the Spence bill, H. R. 5270, to extend the Price Control and Stabilization Acts to June 30, 1947, indicates that the measure will be reported out of committee without amendment. The bill contemplates continuation of premium price payments on copper, lead and zinc.

Stabilization Director Bowles, Federal Reserve Board Chairman Marri-

ner Eccles, OWMR Director John Snyder, Civilian Production Administrator Small, and OPA representatives have appeared for the bill. Snyder insisted that production is the only "real solution" to the problem of inflation, but that price controls are necessary for the time being to secure production and yet hold living costs within reason. He asserted that price controls on given products should be lifted as soon as supply is in reasonable balance with demand. In another appearance before the House Committee on Judiciary, Snyder asked extension of the Second War Powers Act, to keep intact the authority to allocate materials, ration scarce goods and limit inventories.

Administrator Small stated that he saw no reason for extending price controls beyond June 30, 1947, and said that many of them would be lifted before that date, as supplies became adequate.

The testimony of Ralph E. Flanders, appearing for the Committee for Economic Development, called for termination of price control March 31, 1947, asserting that use of a definite date would assure industry that no more extensions were in the offing. Flanders called upon Congress and the Administration to balance the budget in the fiscal year 1946-1947, saying that "this is the time to eliminate every Federal expenditure that is not absolutely necessary and to postpone every project that is postponable." He added that, "Any unnecessary expenditure today is a reckless addition of fuel to the inflationary fire." It is of interest to note that his testimony is in line with the McFarland bill, S. 1815 (see February issue), which makes provision for adjusting the Premium Price Plan "to take into account the increasing proportion of civilian purchases and to reduce the cost to the Government" by raising the ceiling prices on copper, lead and zinc.

Stockpiling

The Thomas-May Stockpiling bill, S. 752, is still in the House Committee on Military Affairs, although the measure was passed by the Senate December 20. In the course of a further hearing before the House Committee February 19, Undersecretary of War Royall stated that passage of the bill is favored by the War Department; he added as his personal view, however, and that of other officers, that the Army and Navy should have a controlling voice in determining the contents of the strategic stockpile. Royall suggested that the Thomas Act of 1935 would provide for the assembling of stockpiles, if sufficient appropriations for purchases were made. It is understood that further information is to be presented

(Continued on page 76)

Personals

Harvey Tedrow, formerly of the London Mining and Milling Co., of Alma, Colo. and American Smelting and Refining Co. is now vice president and general manager of El Paso Mines, Inc., of Cripple Creek, Colo. At the present time Mr. Tedrow is engaged in opening the El Paso and Henry Adney Mines in the Cripple Creek district.

P. R. Paulick, consulting engineer, Library, Pa., has been appointed general manager of the Hellier Coal and Coke Company at Hellier Pike County, Ky. Mr. Paulick assumed the duties of his new position March 1 but will retain some of his consultant work.

R. J. Morton has recently accepted a position on the staff of Oliver Iron Mining Company in Duluth, Minn., as concentration engineer. Formerly he was metallurgical engineer with Burma Corporation, Ltd., in Burma, and metallurgist with Noranda Mines, Ltd., in Quebec.

J. B. Morrow, president of Pittsburgh Coal Company, a subsidiary of the newly merged Pittsburgh Consolidation Coal Company, has announced the appointment of G. A. Shoemaker as operations vice president of the properties of Pittsburgh Coal Company. Mr. Shoemaker is presently operations vice president of the Pennsylvania mines of the former Consolidation Coal Company. H. C. Rose, production manager of Pittsburgh Coal Company continues in this position, reporting directly to Mr. Shoemaker.

J. G. Baragwanath has been named director of exploration of Freeport Sulphur Company, it was announced recently by Langbourne M. Williams, Jr., president.

Mr. Baragwanath, a mining engineer who has played a prominent role in mining developments in Peru, Ecuador, Canada and the United States, has recently been general manager in Cuba of Nicaro Nickel Company, a subsidiary of Freeport Sulphur Company. He will head Freeport's new program to find and develop mineral deposits in any part of the world, Mr. Williams said. Exploration headquarters have already been estab-

lished by the company in Salt Lake City, Utah; Vancouver, British Columbia; Toronto, Canada, and Johannesburg, South Africa.

Oscar N. Friendly, vice president and general manager of the Park Utah Consolidated Mines Co., will resign as general manager of the organization on April 1. Mr. Friendly will continue however as vice president and will be active as a consult-



ant and in the company's policy-making affairs. He will be replaced by Paul H. Hunt of Keetley, Wasatch County, who for many years has been mine manager for the company and who will become vice president and general manager. Mr. Hunt will move his headquarters to the company's office at Salt Lake City.

Jay Littlepage, former director of the Ohio Reclamation Association, an organization of operators to reclaim strip mine lands, has returned to his position after three years in the Navy. He had served as director of the group since its inception. Charles MacIntire, in charge of the Association's activities during Mr. Littlepage's absence, will continue with the group as assistant director.

Following his release from the Naval Air Force, Eugene T. Scott has joined Templeton, Kenly & Co., Chicago, as product application engineer with headquarters in Chicago. Scott will cover a large portion of the United States in his work at sales and applications.

A. W. Vossler has been elected president and general sales manager of the Pittsburgh & Shawmut Coal

Company. For several years he was division freight agent for the Pittsburgh, Shawmut & Northern Railroad. In 1914 he was engaged in the sale and distribution of bituminous coal in the eastern, northern and Canadian markets, and in 1933 became general sales manager of the Shawmut Coal and Coke Company of Buffalo. He will maintain offices in Kittanning and Buffalo.

M. W. Heinritz, vice president in charge of the Storage Battery Division of Philco Corporation, has been appointed to membership on the Electric Storage Battery Industry Advisory Committee of the OPA.

W. Sprott Boyd has opened offices in the Mill Tower Building, San Francisco, Calif. Mr. Boyd, for reasons of health, resigned as executive vice president from Kennecott Copper Corporation last spring. He is, however, continuing his consulting engineering work for the corporation.

William Van C. Brandt resumed his former position recently as manager of Exide Motive Power Sales for The Electric Storage Battery Company, Philadelphia, after serving in the Navy during the war.

Mr. Brandt is an old Navy man, as well as an old Exide man. He attended the U. S. Naval Academy, and served during the first World War in transport service.

Robert Lee Llewellyn, for several years a member of the engineering department of the Island Creek Coal Company, Holden, W. Va., has resigned to accept the position of separation engineer with the Valley Camp Coal Company, Elm Grove, W. Va.

Roland D. Parks, Deputy Director of the Metals and Minerals Division, has left the Civilian Production Administration, Washington, D. C., to resume teaching the Mineral Industry option of the Geology Department, Massachusetts Institute of Technology.

On leave of absence from M. I. T. since 1941, Professor Parks has been engaged on the metals and minerals programs of OPM, WPB, and CPA in successive capacities as Deputy Director of the Miscellaneous Minerals Division, Assistant Director of the Mineral Resources Coordinating Division, and Assistant Deputy Vice Chairman for Metals and Minerals.

For the past three years, Prof. Parks has been associated with the Metals and Minerals Advisory Committee and the Mineral Resources Operating Committee on coordination of minerals programs and stockpiling and for the past 10 months has been Chairman of the Quota Committee, Premium Price Plan for Copper, Lead, and Zinc.

Clarence B. Randall, president of Inland Lime and Stone Company, recently announced the appointment of **A. J. Cayia** as vice president and general manager. Mr. Cayia's headquarters will be at Manistique, Mich. Mr. Cayia has been associated with the Inland Steel Company subsidiary since December 1, 1928, when he joined the company to develop the quarry and construct the plant at Port Inland.

After 26 years, **Charles F. Willis** has retired from the active management of *The Mining Journal* in Phoenix, effective March 1. Mr. Willis plans to devote his whole time to the efforts of the Arizona Small Mine Operators Association and to do public relations work for the mining industry in Arizona and Washington. *The Mining Journal* has been purchased by the Miller Freeman Publications, Inc., of San Francisco and Seattle.

Edgar Monks, formerly resident engineer, Consumers Mining Company, Harmarville, Pa., has been named general superintendent of all coal plants of the Wheeling Steel Corporation.

Michael Scollard, secretary of the Indiana Coal Producers' Association since its organization in 1918, has retired. Mr. Scollard is succeeded by his former assistant, **Ernest V. Agee**.

After 50 years of service, **Dr. James Fisher** retired on December 31 as director of extension activities at the Michigan College of Mining and Technology. He is succeeded by **Prof. F. L. Partlo**, a native of Fairgrove, Mich.

Howard M. Waybright, for the past 17 years in charge of traffic for the Boston office of Eastern Gas and Fuel Associates, has been named general traffic manager in charge of traffic activities for all divisions and subsidiaries. He will be located in the Boston office. **Lawrence Petersen** has been named by Mr. Waybright as assistant general traffic manager. He will supervise traffic for Eastern's Coal Division and Koppers Stores with headquarters in Pittsburgh.

Sam Woodhead, secretary-treasurer, Independent Coal & Coke Company, operating in Carbon County, Utah, has been named operating head at Salt Lake City, with the title of general manager. He will retain his post as secretary-treasurer.

Thomas Denton, formerly acting chief of the Tucson, Ariz., division of the U. S. Bureau of Mines, has accepted a position on the staff of the Potash Company of America. He has been succeeded at Tucson by **W. R. Storms**.

Dr. C. J. Potter, formerly Deputy Solid Fuels Administrator, has been tendered a vote of thanks "for his splendid work during a trying period in the history of the industry as well as the country" by unanimous action of the directors of the National Coal Association.

William R. Chedsey, formerly director of the University of Missouri School of Mines, has been appointed assistant professor of mining engineering at the West Virginia University School of Mines. Prior to his work at the Missouri school he was professor of mining engineering at the Pennsylvania State College.

Rudolph P. Elstad has been elected vice president of Oliver Iron Mining Company, with which he has been associated since 1917. **Warner P. Wolff** has been named chief mining engineer of the Hibbing-Chisholm district and **Robert M. Mole** assistant chief mining engineer.

Ernest L. Bailey, Charleston, W. Va., resigned his position as State Road Commissioner on February 1 to devote his time to private business, including a partnership with **N. T. Rhinehart** in coal stripping. Mr. Bailey is well known in the West Virginia mining field and Mr. Rhinehart is a former chief of the Department of Mines of West Virginia.

The appointment of **William P. Getty** as assistant to the manager of raw materials has been announced by the Jones & Laughlin Steel Corporation. Mr. Getty's entire business experience has been with the steel industry. He was associated with the Weirton Steel Company for 3 years and has been with Jones & Laughlin since 1936.

The Westinghouse Electric Corporation has announced the election of **Gwilym A. Price** as president, succeeding **George H. Bucher**, who has resigned from that office. Under a recent amendment of the corporation's bylaws, Mr. Price as president will be the chief executive officer.

A. W. Robertson, who is chairman has been the corporation's chief executive officer since 1929, is retiring. He was elected chairman of the Westinghouse Board of Directors under the new bylaws and will continue as a member of the Westinghouse organization in a less active capacity.

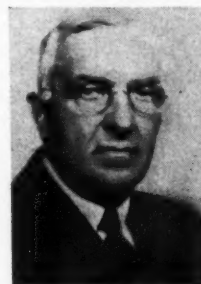
Mr. Bucher was elected vice chairman of the Board of Directors and will continue to serve as chairman of the Westinghouse Electric International Company.

Maurice F. Dufour has been appointed general manager of the Nicaro Nickel Company, a subsidiary of the Freeport Sulphur Company, Langbourne M. Williams, Jr., president, announced recently.

Mr. Dufour, who has recently been

assistant general manager, will continue to reside in Cuba, where the company mines nickel ore and operates a concentration plant under contract with the United States Government.

At its annual meeting February 5 the board of directors of the Ohio Brass Company elected **Charles K. King** to the newly created position of chairman of the board. Mr. King, who has served as president of the



CHAS. K. KING



GEO. L. DRAFFAN

company since 1928, was also chosen as chairman of the executive committee. **George L. Draffan**, executive vice president since 1938, was elected president, succeeding Mr. King.

— Obituaries —

J. E. Hensley, last of four brothers who discovered and developed the mineral wealth of Castle, Mont., died in Coeur d'Alene, Idaho, on January 12 at the age of 86.

Henry McSweeney, president of the United States Potash Company, died on March 5 at his home in Atlantic City, at the age of 91. Mr. McSweeney was born at Pittsburgh; early in life became interested in the oil business and in 1918 he helped form, with the late James H. and George C. Snowden, the Snowden & McSweeney Company. In 1925 this firm was drilling for oil in southeastern New Mexico when potash was discovered in one of the wells. This resulted in the development of the great potash deposits in the vicinity of Carlsbad, N. Mex.

NEWS *and* VIEWS

Paradise for bituminous coal miners' children! Camp Lightfoot, summer camp, is first of its type in coal regions. Built in 1941 by the Koppers Company, it provides summer vacations for boys and girls, 90 per cent of whom are bituminous coal miners' children. Its success is indicated in the item below



—Hamilton Wright Photo

Eastern



States

Koppers Reports Increased Enrollment At Children's Recreation Camp



Thomas E. Lightfoot, director of welfare for Koppers Coal, reports that the two summer camps maintained for the children of Koppers coal miners by Eastern Gas and Fuel Associates, broke all previous attendance records during the last summer with a total of 884 children of Koppers coal miners at the camps during the four two-week camping periods. Two camps are maintained, the original one, Camp Lightfoot, was started in 1935 with an enrollment of 73 children and Camp Wyndal in 1939 with 23 children. Since the two camps were opened 5,816 children have had the advantage of the recreational health building facilities and have profited from the instructions given in these camps. The camps are operated by Koppers Recreation Camps, Inc., a non-profit corporation of which Mr. L. C. Campbell, vice president of Eastern Gas and Fuel Associates, Koppers Coal Division, is president.

Changes in Personnel at Consolidation Coal Co.

Announcement has been made by Consolidation Coal Company of the following changes in supervisory per-

sonnel in its West Virginia Division mines as of late January and early February. At Mine 32, at Owings, Virgil Mackey was promoted from section foreman to assistant mine foreman and at the same time Joseph Akers and Spencer B. Collins were made section foremen. At Mine 25, Pinnickinnick, Delmo Knight was promoted from section foreman to assistant mine foreman and Frank Davis was appointed section foreman. At Mine 63, Monongah, the following were appointed as section foremen: L. H. Briggs, Lloyd N. Fleming, Lawrence O. Godby, Riedy W. Davidson, J. A. Farinash, H. O. Marquis, and Claire Boone. In addition George C. Cain was promoted from section foreman of Mine 32 to mine foreman of Mine 63, taking the place of Mike Smith who was transferred. At Arkwright Mine at Granville, Arnie E. Carder and Frank H. Brooks, Jr., were both made section foremen and at Mine 97, Rivesville, Robert L. Spragg was appointed section foreman and Charles H. Gaskill as fire boss.

Coal Men Planning For Future

Over 150 southern coal producers from southern West Virginia, eastern Kentucky and Virginia attended a meeting recently at the Hotel Pritchard, Huntington, W. Va. This is the beginning of a series of meetings

which are planned for the study of the competitive position of these fields with Northern and Western fields of the coal market. Attention was first centered on the comparative position of coal and the competing fields of oil, gas and hydroelectric energy, and the fact that research in the competing fields has been extensive in order to broaden markets. L. A. Woods, president of Crystal Block Coal and Coke Company and H. A. Glover, vice president and sales manager of Island Creek Coal Company, led the discussions. Both illustrated their talks with charts and graphs. Speakers emphasized that coal is in strong demand due to the needs of industry, and in preparing for full re-conversion following the war. The speakers stressed the need of improved preparation practice and the lowering of production and distribution costs after present market demands have leveled off.

T.C.I. & R.R. Co. To Open Up New Mine



A large coal mine will be opened up by the Tennessee Coal, Iron & R. R. Co., a subsidiary of the U. S. Steel Corporation, to supply their furnaces and by-product plant at their Fairfield operation. This will be a shaft coal mine about 600 ft. in depth and will reach a rich vein which averages about 5 ft. in thickness. The mine will be located in what is known as the Concord area, about 8 miles from their furnaces and a railroad will be built to connect with it. The seam is expected to yield roughly 40,000,000 tons of coal for industrial

use. Coal from this mine will require washing before delivery to the by-product plant, consequently, this calls for the erection of large coal washer. To furnish sufficient water for this project a large dam will be built to impound some 147,000,000 gallons of water. In addition, a top house and tippie as well as a power house, shops, and other buildings will also be constructed and a large outlay of machinery and other equipment will be required to get the mine in operation. It has been estimated that more than \$2,500,000 will be spent on the project before the first coal is ready for use.

Valley Creek Canal May Be Approved

For a number of years there has been discussion of a canal to connect the city of Bessemer to the Warrior river, this canal to be known as the Valley Creek Canal. This is a distance of approximately 15 miles and seven locks will be required. Recently a hearing on this project was held in Bessemer before government representatives and there is a feeling of optimism concerning final approval in the near future. Backers of this project claim it will be of great benefit to shipping and industry generally in the Birmingham district, as it would tie in the system of inland waterways of which the Warrior river is a part.

American Zinc Institute Cancels Meeting



The American Zinc Institute has canceled its anticipated convention in St. Louis in April because of the continued congestion of hotel and railroad accommodations.

A meeting of active members will be held in New York during April to comply with the by-laws. Only the necessary legal formalities will be dealt with, which will call for a very limited attendance.

The Executive Committee and Board of Directors will hold a combined meeting in New York about the middle of April.

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Research in Coal Points to Many New Uses

Railroad locomotive fuel costs may be cut to one-third or one-fourth of their present level by use of a coal-burning gas turbine now in an advanced stage of successful experimental development, according to J. I. Yellott, director of research of the Locomotive Development Committee, sponsored by a railroad group in co-operation with the Bituminous Coal Research, Inc. and Bituminous Coal Institute. The successful use of the gas turbine in aviation coupled with the nation's vast coal resources is stimulating research on new uses of coal in the gas turbine. Work is being done on the problem of adapting the gas turbine to the burning of solid fuel and a number of solutions have been proposed according to Mr. Yellott. Due to the high thermal efficiency of the gas turbine, coal requirements for the standard steam locomotive can probably be reduced about 25 per cent. Coal for uses in this type of turbine must be pulverized and a new invention by which coal can be so processed is being experimented with. The burning of coal under pressure is done with the aid of simple equipment which re-

sembles in principle the aircraft jet propulsion combustor. The removal of the ash in the form of a dry powder is accomplished by the use of small mechanical cyclone separators.

J. D. Ratcliff, reporting in *Collier's* weekly in early February, indicated that a coal-fired freight plane was a distinct possibility in near future as well as coal-fired automobiles. Mr. Ratcliff indicates six possibilities as to the use of coal in the near future as follows:

1. Gasoline from coal, at possible 6 cents a gallon.
2. A smokeless furnace which "gets 50 per cent more heat from a ton of coal than today's equipment." It is stated that such a furnace would be only about twice the size of a milk can as used by farmers and furnaces this size could heat an 8-room house.
3. A smokeless furnace heating unit for groups of houses with steam piped to the individual users.
4. A new smokeless kitchen range which is magazine fed and cleaned and perfectly controlled.
5. A new coal air conditioner for homes and commercial buildings.
6. An over-fire air jet, which burns coal completely and makes coal-burning locomotives smokeless.

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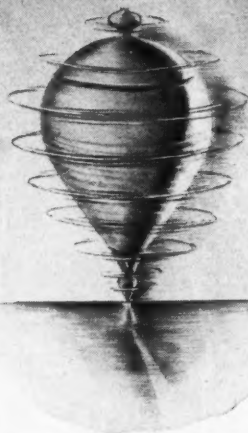
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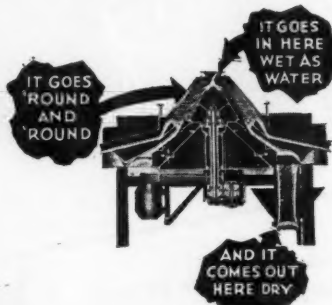
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Sludge and slurry coals are also being reclaimed by using this machine. Where a large part of the ash is in the finest sizes, ash content as well as the water content is reduced.

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River Diversion



The Hudson Coal Company has recently completed diversion of the Lackawanna River near Carbondale, where John Booth, Inc., is carrying on a stripping operation. This diversion permits extension of stripping into an area where a fairly large block of solid coal was left beneath the river.

Pennsalt Retirement Plan to Cover All Employees

The Pennsylvania Salt Manufacturing Company has announced a company-financed retirement program which will affect all employees, including hourly workers, in its plants and offices from coast to coast.

Leonard T. Beale, president, said the plan, immediately effective, will provide for the retirement of all employees, from officers down, at the age of 65, unless otherwise specifically ordered by the Board of Directors.

Under the retirement benefit plan, employees will be eligible for monthly payments of 1½ per cent of the highest annual pay in the three years preceding retirement, multiplied by the years of service. The maximum monthly payments will be 40 per cent of the highest annual pay less an amount equal to Social Security benefits.

"Since the company is paying the entire cost of the plan," Mr. Beale said, "we reserve the right to modify or discontinue it if circumstances war-

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rant such action. However, we consider a sound retirement plan one of the primary charges upon the company's net earnings."

New Pipe Resists Acid Mine Waters in Coal Mine Installation



The Maryland Bureau of Mines reports that at Kempton No. 42 Mine of The Davis Coal and Coke Company at Kempton, Md., the company recently installed in the main hoisting shaft a pipe column of new construction. This installation should be of great interest to coal mine operators who are troubled with acid mine water eating up the metal of pumps and pipes. The pipe is made of steel but is lined with vulcanized rubber. It has been in use for several months and apparently the rubber is preventing corrosion of the interior as well as reducing and preventing stoppages. It is obvious that when column pipes in shafts are as large as 10 or 12 in. in diameter, not only is the first cost of the pipes great, but installation is also expensive, and if pipes have to be renewed and cleaned considerable delay is involved in mine operations.

In the past a number of schemes have been tried to combat corrosive action of mine waters in column pipes and in some localities wood pipe, often hemlock, has been used. The wood pipe was bound about with phosphor bronze hoops which were quite light in construction but when these failed the wooden column pipe failed also. In some parts of the country column pipes are made of concrete, while in other localities operators have considered treating the water in large sumps at shaft bottoms before permitting pumps to elevate it to the surface. It is obvious that this is an important improvement in piping technique and may result in considerable saving of time and money.

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Annual Meeting Illinois Coal Operators Association

 At the Sixteenth annual meeting of the Association held in Chicago February 19, the following were elected as members of the Executive Board until the next annual meeting, or until their successors are duly elected:

Executive Board—D. W. Buchanan, J. Roy Browning, D. H. Devonald, George B. Harrington, Hubert E. Howard, E. R. Keeler, T. C. Mullins, T. J. Thomas, A. H. Truax, Wm. P. Young.

Mr. C. W. Peterson was elected treasurer.

Immediately following the close of the meeting the Executive Board met and elected the following officers and general counsel for the ensuing year: President, George F. Campbell; secretary, Fred S. Wilkey; general counsel, Thurlow G. Essington.

Mine Safety

A plan to establish state and district organizations in each coal producing state to plan and execute an intensive safety drive in all coal producing areas has been proposed by the coal mining section of the National Safety Council.

Sponsored and aided by the Council, the state and district organizations would be composed of equal representation from operators, miners, state departments of mines and the U. S. Bureau of Mines.

The training and experience of these groups also would be used to formulate sane, acceptable standards governing safety in coal mines.

"The coal mining industry has the knowledge and the resources to stop many more accidents than are being stopped today," said Edgar C. Weichel, general chairman of the Council's coal mining section and assistant general manager of the Hudson Coal Co., Scranton, Pa. "The time is ripe for an agreement by all parties concerned on exactly where and how this knowledge and their resources can best be applied, both for the greater operating efficiency of the country's coal mines and for the protection of the men who work in them."

The coal mining section program is in line with the national post-war accident prevention campaign which

President Truman has directed the National Safety Council to undertake.


"We recognize that safety is management's job," Mr. Weichel said. "We also recognize that this job cannot be successful without the cooperation of organized labor, the United States Bureau of Mines and the state departments of mines. Therefore, we propose to bring together all these forces and combine their resources against the oldest enemy of both management and labor."

Illinois Society Elects Officers

The Illinois Society of Coal Preparation Engineers & Chemists held its annual meeting for election of officers on February 15, 1946. Officers elected were: George A. Strunck, Old Ben Coal Corp., president; Tom. L. Garwood, Chicago, Wilmington & Franklin Coal Co., vice president; J. Laning Dress, Binkley Coal Co., vice president; and Carl E. Campbell, Shell Oil Co., secretary-treasurer.

The programs and meeting of the group will be held on the third Friday of each month at Benton Country Club, Benton, Ill.

Court Decision

 In a memorandum opinion on the merits, filed in the District Court of the United States at Joplin, Mo., February 13, 1946, District Judge Albert L. Reeves decided for the defendants in a suit for rescission of a contract to transfer an invention, brought by Charles B. Hebbard against the American Zinc, Lead & Smelting Company and Minerals Benefication, Inc. The *Joplin Globe*, in reviewing the decision, made the following comments:

"The case had been watched with considerable interest by the mine industry in this area because it involved the use of an improvement in the Wuensch process known as an air lift in the treatment of lead and zinc ores.

"Judge Reeves held that the defendant companies had fulfilled their obligations to Hebbard, formerly a draftsman and engineer who worked for MBI, and that Hebbard was not entitled to recover anything.

"Hebbard brought suit not only to rescind a contract whereby his former employers produced the device in question but also sought an accounting and settlement which, had he won, would have involved a large amount of money. The process now has wide usage.

"The case was tried before the late Judge Otis in Joplin in October, 1944. It was said to have been the last major case he tried before his fatal illness and death early in 1945. He




never decided it. By agreement the case was submitted to Judge Reeves on a transcript of the testimony plus exhibits and briefs followed by oral arguments."

International Nickel Opens New Office

The International Nickel Company, Inc., announces the opening of the St. Louis Technical Section of its Development and Research Division. Offices will be located in Room 810 of the Ambassador Building, 411 North Seventh Street, St. Louis 1, Missouri. This new section will be under the direction of George A. Fisher, Jr.

Old Napoleon Mine Opened by West and Company

 The old Napoleon Mine in the southeastern part of the Thoms Station mining area has been reopened by West and Company. Operations are being carried on around the 170-ft. level, and recoveries are reported of 10 per cent zinc blende. The Thoms Station mill is treating the ore. This is the custom mill of the St. Louis Mining and Milling Company.

The mine was dewatered by the in-

stallation of two turbine pumps and mine operations are being carried on at No. 2 Shaft under the direction of Luther Owen of Joplin.

Stripping Operations on Swartz Land

W. O. York and Associates of Baxter Springs are conducting stripping operations on the Swartz land east of Lone Elm on the north side of Turkey creek. Power shovels and drag lines are being used to work the shallow zinc ore deposits on the creek bottom along the right bank. Ore from the operations is being treated

over the Swartz mill just a few hundred feet to the northwest.

Dines Mining Co. Starts New Shaft

A new shaft is being sunk on the Stoskopf property to the west of Hartley mine by the Dines Mining Company. The new shaft will extend to a depth of 300 feet to expand the company's ground operations in the area. A 400-ton hopper and derrick at the company's Douthat mine on the DeVilliers land, a mile south of Cardin, will be used at the new development.

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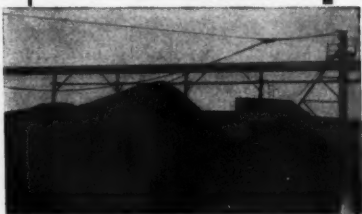
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Butler Brothers Hold "Old Timers" Dinner

At a dinner held January 15 at the Memorial Building in Nashwauk, employees of Butler Brothers with 15 or more years of continuous service were guests at a dinner honoring the old timers. Earl Mollard, general superintendent, welcomed the employees to this dinner on behalf of Butler Brothers, and Hazen Butler,

vice president of the company presented John Hansen with a \$1,000 scholarship trust agreement. John Hansen was the winner of the grand prize in the 1944 suggestion contest. Four men with more than 40 years of service received \$100 bonds. They were William Olson, Gust Weggum, John Tuomainen and Charles Johnson. Over 200 attended the dinner which offered an opportunity to many old employees for getting together with old friends.

New Single Cord Conveyor Belt Installation

Replacing a previous installation in which three belts in series had been used, a single cord conveyor belt installed in one of the leading Minnesota ore mines has handled an hourly average of 900 long tons of ore, a total of more than 2,250,000 tons during the 1945 season, reports the B. F. Goodrich Company, makers of the belt. This is an average of 30 more tons daily than had been previously handled by the three-belt system.

The belt is 30-inch, eight-ply, 1,556 ft. center-to-center, from the head pulley shaft to tail pulley shaft, with an overall lift of 149 ft. It runs 550 ft. per minute, and was made endless on the job.

One of the features of the conveyor is the unique design of the drive, the head pulley being driven by two 100 h.p. motors on each side of the shaft and the secondary pulley by one 100 h.p. motor. Both pulleys drive the belt from the bottom or clean side cover of the belt, and this, coupled with heringbone lagging has given slip-proof operation.

European Coal Organization

THE Governments of the United States, Great Britain, France, Belgium, the Netherlands, Luxembourg, Norway, Denmark, Greece, and Turkey have agreed upon the establishment of a permanent group for the distribution and control of European coal supplies. Known as the European Coal Organization, it has since last May been untangling Europe's coal supply and distribution problems, and from now on will function on a permanent basis. The headquarters of the organization will be in London. Poland, the Soviet Union, and Yugoslavia have been invited to join.

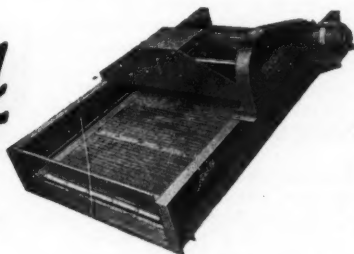
Without the presence of the Soviet Union and Poland it is considered in London that it will be difficult to make the organization function satisfactorily as regards restoring the flow of coal to industries and homes. Fortunately, in recent weeks there has been a marked improvement in the French coal situation.

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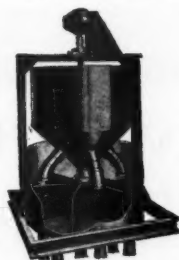


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Registration of Boulder County Mines

 The Boulder County Metal Mining Association is planning a complete program of mine registration. So many inquiries have been received from mine owners in regard to operation of their mining properties that it has been decided by the Association to tabulate information concerning available mines which are not working at the present moment. All pertinent facts about each mine will be registered and this information will be made available to those who desire to find properties to operate. In addition, a circular letter has been sent to owners of mining properties who live outside of Boulder County notifying them of this project. A registration fee of \$2 is being charged for each listing, the purpose of the fee being to support the cost and maintenance of the registration. Forms may be obtained at the assay offices of Hill and Jude, 1219 Spruce, or those of C. G. Bynum, 839 Pearl Street, Boulder, Colo.

Manpower Shortage in Colorado Mines

At the present moment Colorado is suffering a serious shortage in skilled miners, particularly at Cripple Creek, in the Leadville-Climax district, and at Silverton in the San Juan. This shortage has resulted in curtailment of operations on several properties, and in other regions mine development has been definitely slowed down. It is anticipated that there will be some improvement in the situation by mid-summer.

New Mexico Miners and Prospectors to Meet

 The New Mexico Miners and Prospectors Association, whose annual meetings were interrupted by the war, has definitely set April 19 and 20 for its 1946 session at Albuquerque, according to an announcement by Horace Moses, president. Mr. Moses is general manager of Chino Mines Division, Kennecott Copper Corporation properties, with

mine at Santa Rita and mill and smelter at Hurley. An interesting program is being arranged by Association Secretary R. H. Downer. An invitation will be extended to John C. Kinnear, New York, vice president and managing director of Kennecott properties in New Mexico, Arizona and Nevada, to be the principal speaker. Also expected to attend the meeting are New Mexico's two senators, Carl A. Hatch and Dennis Chavez.


New Mining Camp Near Silver City

The Bradley Mining Company of San Francisco has awarded a contract for the building of a new and modern mining camp at the historic gold-silver camp of Mogollon, 80 miles northwest of Silver City; a bonanza precious metals producer in the 80's and early 90's. General manager in charge of all operations will be T. A. Monahan, San Francisco engineer and mine operator. Another company now active in the Mogollon district is the Silver Creek Mining Company headed by Ira L. Wright, Silver City mine operator and engineer.

Increased Enrollment at Socorro

Increased enrollment for the second semester has been proposed by President R. H. Reece, of the New Mexico School of Mines at Socorro. Registration jumped from 30 at the beginning of the fall term to more than 90. The largest pre-war enrollment of the School of Mines was 175, but inquiries are coming in for next fall. This supports the prediction of enrollment of more than 300 students. Degrees are granted in Mining Engineering, Metallurgical Engineering, Geological Engineering, Petroleum Engineering and Civil Engineering.

Wage Negotiations Completed

 Hourly-rated employees at the Geneva Steel plant, Geneva, Utah, and the nearby Keigley quarry, which serves the mill, voted on January 31, at a union mass meeting, to accept a 15 cent an hour increase in wages offered by the company, it was announced by the United States Steel Corporation. The negotiations were concluded by the American Federation of Labor Negotiating Committee representing the 700 workers involved and officials of the Geneva Steel Company, a United States Steel Corporation subsidiary. Under the terms of the agreement, there is no retroactive provision, and the wage increase is effective immediately. The union originally had demanded a 30 cent an hour increase. The Government-owned Geneva

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plant, the largest steel mill west of the Mississippi, was built and operated for the Government by United States Steel. Steel production in the Geneva Plant was discontinued on October 12, 1945. At the present time, the company is operating, for the account of the U. S. Government, one blast furnace and one battery of coke ovens for plant maintenance purposes, pending disposition of the entire plant by the Surplus Property Administration.


The 15-cent increase was negotiated without any strike or other interruption of work.

Walther Mathesius, president of the Geneva Steel Company, represented the company in the negotiations. The AFL delegation was headed by Irvan Cary, chairman of the union's negotiating committee.

Option Given on Silver King Western Property

Under an agreement recently reached Gold Fields Consolidated geologists and engineers will have several months to decide whether to develop the Silver King Western properties. The Silver King Western mining property adjoins the Silver King Coalition holdings in the Park City district. Under an agreement just reached, if Gold Fields Consolidated engineers decide to conduct development of the property Gold Fields Consolidated will acquire Silver King Western stock at \$1 per share. It is understood that a substantial amount of stock will be involved if the agreement is consummated.

New Butte Community Memorial Hospital

 D. M. Kelly, vice president in charge of western operations for the Anaconda Copper Mining Company, has presented the Butte Community Memorial Hospital Association with the sum of \$250,000 from his organization towards a fund to equip and build a new community hospital in Butte. This hospital will be one of the finest in the Northwest and will be conducted on non-profit basis. A board of trustees has been named and Sam Barker, Jr., consulting engineer for the Butte Copper & Zinc Company is heading the board. Any profits that may accrue during the operation of this hospital are to be used for charity patients as provided for by the articles of incorporation.

Instruction Planned for Returning Veterans

Chester H. Scott, former radio technician second class, teaching radio

and mathematics in the naval training school in Chicago, has joined the faculty of Montana School of Mines where he will teach sub-freshman mathematics and assist in some sections in freshman mathematics.


Mr. Scott's work will carry out the promise made to returning servicemen that sub-freshman work will be given those who did not complete high school when they entered the service. It is believed that a returning serviceman will feel that he is too mature to return to high school. To meet this situation Montana School of Mines has planned this phase of instruction since the war ended and is now putting it into effect in time to meet the registration of many servicemen entering with the beginning of the second semester.

"We shall give returning servicemen preparatory work, in a college environment, among other veterans, which they missed by serving their country. Servicemen may enter Montana School of Mines at any time," Dr. Francis A. Thomson, president, said.

New Clubhouse For Anaconda Copper Mining Employees

The former Thornton Hotel building in Butte is being completely renovated to furnish a clubhouse and recreation hall for the employees of the Anaconda Copper Mining Company. Similar club houses will be established in Anaconda and Great Falls. The former club house, at Great Falls, burned down a few years ago.

Getchell Mine to Increase Output

 Roy Hardy, consulting engineer, reports that changes being made at the gold plant of the Getchell Mine will increase the milling capacity to upward of 1,200 tons. In addition, the new shaft station will be completed in about a month and cross-cutting to the west will be well under way to cut the vein 3,000 ft. north of the main workings. Mr. Hardy states that a series of churn drill holes indicate good ore in this locality.

New Plan for Mackay School of Mines

At a recent meeting of the Nevada State Mining Advisory Board held at Carson City, recommendations were made to expedite mining rehabilitation throughout the state. The recommendations called for enlarging the scope of the Mackay School of Mines at the University of Nevada at Reno. The plan calls for a pilot metallurgical plant in which large scale tests

can be made on refractory and other ores and, in addition, a "practice" mine and a complete geophysical laboratory.

Two New Operations in Arizona Appear Promising



The Cedar Talisman Consolidated Mine Company has purchased a 70-ton capacity milling plant for installation at the French Lily mining property located at Cleaton, Yavapai County, Arizona. It is estimated that roughly 75,000 tons of ore are now available for milling, and the plant is expected to be completed and ready to start operations by the first of May. Another property situated 19 miles north of Kingman in the Cerbat Mountains has recently shipped rich ore with assay averaging \$70 to the smelter at Clarkdale. This is the Eagles Mine in Mohave County, now operating with two shifts under the direction of Jack Miller. In the past the Eagles has produced \$250,000 in gold and silver and in reopening the mine it is expected that a daily average of a carload of ore to the smelter will be maintained.

Idaho Mining Association Meeting



The Idaho Mining Association is holding its 1946 meeting at the Owyhee Hotel in Boise, Idaho, from April 5th through 7th. Reservations should be made through Harry W. Marsh, secretary, Idaho Mining Association, 304 Baird Building, Boise, Idaho.

Sunshine Pays First '46 Dividend

The Sunshine Mining Company has announced its first dividend for the year 1946 of 10 cents per share payable March 1. This is the first quarterly dividend and totals \$148,882. Sunshine's total dividend disbursements including this latest to date are \$25,285,181. The company has also issued its annual report and President Hardy stated "net profits from all operations for 1945, after making provisions for income taxes was \$804,050.02. Dividends for the year totaled 40 cents per share, and surplus was increased by \$208,521.62."

In reporting conditions in the mine, Ross D. Leisk, general manager, said, "The most important development of the year was the discovery of lead-silver ore in the Silver Syndicate fault zone on 3,700 level at a point 350 ft. due north of the Jewell shaft in terri-

tory in which Sunshine Mining Company and Silver Syndicate, Inc., have equal interests. The ore varied in width from a few in. up to 12 ft. in a length of 169 ft. explored by drifting up to the end of the year."

Vindicator Mining Company Proceeding With Development Work

Vindicator Mining company, developing a silver-lead property east of the Lucky Friday at Mullan, has now completed all preliminary work, including roads, mine buildings, machinery and mine equipment, and is proceeding with development work on the vein at a depth of about 300 ft. This work will include a raise from the lower tunnel to the surface to determine the strike and dip of a prominent outcrop of rich silver-lead ore.

1946 Mining Committee Named



Appointment of members of the 1946 Mining Committee of the San Francisco Chamber of Commerce was announced today by President Brayton Wilbur.

George B. Dodge, one of the owners of the American Rubber Manufacturing Company, who is widely known among western mining men, will again serve as chairman of the Committee.

Members who have been named are: B. C. Austin, mining engineer; Thomas V. Barton, Consolidated Chollar Gould & Savage Mining Company; Robert Beale, attorney; James Bradley, Bradley Mining Co.; Phil R. Bradley, Jr., Pacific Mining Company; Worthen Bradley, Bradley Mining Co.; E. B. deGolia, mine operator; Charles A. Dobbelt, mining engineer; Gordon Gould and Henry W. Gould, H. W. Gould & Co.; H. N. How and Jack How, Western Machinery Co.; Herbert D. Imrie, Abbot A. Hanks, Inc.; Ira Joralemon, mining engineer; Albert F. Knorp, American Mining Congress; Mack C. Lake, Hanna Development Co.; W. W. Mein, Jr., Calaveras Cement Company; Edwin L. Oliver, Oliver United Filters, Inc.; George W. Rust, Reconstruction Finance Corporation; H. A. Sawin, Yuba Manufacturing Company; Robert M. Searls, attorney; Walter Stalder, petroleum geologist; Roland Tognazzini, Union Sugar Company; Roy E. Tremoureaux, United States Lime Products Corporation; F. C. van Deinse, Yuba Consolidated Gold Fields; Gilfry Ward, American Manganese Steel Division; Leonard C.

Wyman, Division of Corporations; Judge Edgar T. Zook, attorney; and William J. Losh, Regional Service Committee.

Walker Mine to be Reopened

R. P. Wilson and associates are planning to reopen the famous Walker-Copper Mine in Plumas County, California. The property was shut down in 1941 by the Walker Min-

ing Co. a subsidiary of Anaconda Copper Mining Co. The property comprises 700 acres of mining rights and 1,600 ton flotation concentrator and 9 mile aerial tramway. The mine employed over 500 men in 1940, the year which was the last full season of operation and that season produced 5,262 tons of copper, 14,176 ounces of gold and 237,891 ounces of silver. For some years the Walker Mine was California's largest copper producer.

Wheels of Government

(Continued from page 64)

to the Committee by representatives of the Army and Navy on stockpile quantities and on appropriations that would be required. Following this the Committee is expected to report S. 752 to the House for action.

St. Lawrence Seaway

Senator Hatch's (Dem., N. Mex.) Foreign Relations subcommittee has concluded a 16-day round of hearings, which began February 18, on the bill to approve the Great Lakes-St. Lawrence Seaway and Power Project. Among the proponent witnesses have been Dean Acheson, Undersecretary of State; Oscar Chapman, Assistant Secretary of Interior; Leland Olds, Federal Power Commission Chairman; General F. B. Willey, New York Power Authority; Julius Barnes, National St. Lawrence Association; and N. R. Danielian, St. Lawrence Division, Department of Commerce.

Opponents, including representatives of the mineral industry, maritime groups, railroads, and chambers of commerce, have asserted that there is no economic necessity for the project and that available manpower, materials and money could be better used to complete domestic projects. Stress was laid upon the fact that the seaway could be used only seven months of the year and that ships under foreign flags would benefit more than our American vessels. The point was made that the U. S. would export no coal through the seaway but that foreign coal will invade our domestic markets.

R. C. Allen, speaking from his long experience in Lake Superior iron mining and also as president of Reserve Mining Company, an enterprise formed to utilize the taconite deposits of the eastern Masaba Range, opposed the building of the seaway. Allen also voiced the objection that we cannot afford the things we don't need, stating that the St. Lawrence Project should be postponed, at least until we have balanced the national budget and have paid back at least a part of the money that has been borrowed to keep this Government in operation. Secretary Julian D. Conover stated for the

Mining Congress that in addition to entailing an immense cost to the taxpayers at a time when Government expenditures must be reduced, there is no need for either the transportation or power facilities which would be constructed at public expense. He said that the proposed waterway, duplicating adequate existing transportation facilities, would serve primarily not as an outlet to world markets for American products, but as an inlet to the heart of America for the products of cheap foreign labor. Conover added that mining and metallurgical development of our immense reserves of lower grade iron ores would be discouraged, and the great capital outlays required to make these resources available would be deterred, thus jeopardizing our future self-sufficiency in respect to a raw material which is the basis of our industrial and military strength.

Secretary of Interior

The installation of Julius A. Krug as the new Secretary of the Interior on March 6 followed the spectacular departure of his predecessor, Harold Ickes, who committed the unpardonable party sin of turning on the Administration of which he was a part.

Secretary Krug, 38 years of age, hails from the University of Wisconsin. After service with public utilities and with the Tennessee Valley Authority, he was director of the power section for OPM and WPB, rising to vice chairman of that organization in 1943. He then went into the Navy and was recalled to the WPB chairmanship in 1945. Krug's action in the prompt elimination of WPB controls over industry following V-J Day was received with marked approval.

In considering the nomination of the new Secretary, members of the Senate Committee on Public Lands and Surveys examined him closely. Included in his responses were the statements that the best government is the least government and that it is desirable to decentralize and get as close to the people as possible; that with respect to mining and agriculture, he felt that he had a lot to learn, but that he had a deep interest in public service and a profound be-

lie in democracy and in the application of common sense to problems that arise. He stated that he had no preconceived ideas regarding development of the domestic mineral industry as against the bringing in of minerals from abroad. As to his attitude on the established mining laws and the extension of the leasing system, he stated that it would be the duty of the Department of the Interior to administer the laws as Congress intended. Krug responded to a direct question by Senator Ed Johnson, of Colorado, that he would consult with Western Senators on public lands problems before determining policy toward important actions. On the question of "Valley Authorities" similar to TVA, he said, "You can't abolish state lines and state rights—the problems are too complex and they may call for separate programs within the individual states."

Radio-Active Minerals

The Executive Order of December 13, 1945, withdrawing from location and entry public lands containing radio-active minerals, has been revoked and superseded by a new Order 5701 issued March 4. The prospector, lessee or permittee may now again proceed in the normal way, and in granting patents, leases or permits the Government will include a reservation that all deposits of "fissionable materials" shall be subject to control of the Government and to the rights of the United States to enter upon, prospect for, mine and remove such materials.

A bill to enact this procedure into law has been introduced by Senator Hatch, of New Mexico. It defines the term "deposits of fissionable materials" as those deposits from which thorium, uranium, and elements higher than uranium in the periodic table can be refined or produced. It also includes any deposits from which there can be refined or produced other substances determined by the President to be readily capable of or peculiarly related to transmutation of atomic species, the production of nuclear fission, or the release of atomic energy. Quick Senate and House passage of the measure is anticipated.

Suspension of Assessment Work

Question of the dates over which the suspension of assessment work on mining claims is effective has been cleared up by a letter received by Senator Carville (Dem., Nev.) from the Department of the Interior. The Department states that under existing law all holders will have until July 1, 1947, for the performance of their assessment work if the cessation of hostilities is declared at any

time prior to July 1, 1946. Should this declaration be postponed until a later date, the time for performance of assessment work would be extended for at least one year beyond July 1, 1947.

Water Infusion

(Continued from page 61)

pillars, and, while the holes were not bored at right angles to the facings, they were put in so as to cut the maximum number.

Pressure required. It was found that the water could be successfully passed into the pillars at pressure varying from atmospheric to 90 p.s.i., but that the pressure most suitable for condition in pillars in question varied from 35 to 40 p.s.i.

Reduction of Dust. In September, 1944, during the initial stages of the experiment, the working face, which otherwise would have been dry and very dusty, was observed to be covered with a damp black film which could not be dispersed into the atmosphere, but which left a black smudge on the hand when rubbed.

Measurements of the mine air by the Owens Dust Collector, taken at three places in a pillar split while it was advancing towards, cutting through, and driving beyond a bore hole, gave the results shown below; the third test was made for comparative purposes as the face was then outside the influence of the zone treatment.

Position of face	Moisture in coal -20 mesh	Dust Particles per c.c.
30 ft. from bore hole...	8%	18
36 ft. past bore hole...	3%	209
51 ft. past bore hole...	1.4%	1,167

Water Retention. It has been demonstrated that the treatment remains effective for at least eight months, and apparently for longer periods which it has not yet been possible to check.

Quantity of water. The tests reveal that the use of about 1½ gallons of water per cubic yd. of coal gives ideal conditions, but, where water has been forced in at the rate of 2 gallons per cubic yd. of coal, the conditions have been too moist. Experience has shown that water alone, without reagents, effectively deals with the dust.

Boring in Solid Workings

For test purposes, long holes were bored in solid workings or development headings, but with negative results. The maximum pressure avail-

able (upwards of 200 p.s.i.) would not force any material quantity of water into the coal. Shorter holes 15 ft. in length were tried with little better results. In one hole, water at 160 p.s.i. pressure was absorbed at the rate of 8 gallons in 24 hours, then ceased; in another at 200 p.s.i. pressure, the results were completely negative.

By a comparison of notes and cooperation with the management of the adjacent Metropolitan Colliery, it was ascertained that, in one instance recently, the short holes from 5 ft. to 14 ft. used at that Colliery have been saturated at pressures ranging from 100 to 130 p.s.i., while others ranged to 200 to 300 p.s.i.

Conclusion

The work carried out has, as it were, merely scratched the surface of what appears to be a field opening up much ground for further and more comprehensive research. In the meanwhile, the results achieved are very satisfactory and the practicability of the method has been demonstrated.

Water Infusion Tests in the United States

By CARL SCHOLZ

Consulting Engineer
Charleston, W. Va.

THERE is no question that rock-dust has prevented the propagation of mine explosions, but it does not prevent dust at the face as the result of under-cutting and shooting. Several years ago, I recalled a statement made in 1910 by Dr. Carl Meissner regarding infusion of water under pressure for the purpose of driving away the gas in vein surrounding the shot holes, which, with the use of black powder, was an important safety factor and I began tests with infusion.

The results were most gratifying, the cost was small. It was found that by drilling the shot holes and treating them with a calcium chloride solution before making the undercut, there was no dust at the face, that the gas was driven out at the face and the filling of fine crevices with water made possible the reduction of explosives by 25 per cent, and a much coarser coal was produced.

As the result Patent No. 2,063,761 was issued to me in December, 1936, but due to pressure of other matters, this process has been unused and I have offered it to the Bureau of Mines, hoping that its adoption may save lives and certainly increase the comfort of machine operators by eliminating the dust nuisance and give better visibility.

MANUFACTURERS FORUM

New Dust Goggle

A new dust goggle which is said to provide greater safety and comfort for industrial and other workers is announced by American Optical Company, Southbridge, Mass.

The new goggle is equipped with an acetate eyecup that permits a wider angle of vision and is more comfortable to wear. In addition, a



thin wire screen, on the inside of each side shield, gives maximum protection against fine dust particles.

The new eyecups are individually shaped to conform to the contour of the right and left eye. They fit snugly against the face to keep out dust and powder. The ventilating system extends over a larger area to reduce the possibility of fogging. The fine wire mesh screens prevent dust from reaching the eye. They are easily cleaned by a blast from an air hose or a thorough washing.

Equipped with clear AO Super Arm- orplate lenses, the goggle's retaining rings are of solid fiber. The goggle is also available with rubber cushion, on request.

Duff-Norton Announces New Mine Roof Jack

A new, economical Duff-Norton mine roof jack, eliminating the necessity for large stocks of various heights of roof jacks, can be "tailored to fit the job," according to the Duff-Norton Manufacturing Company, Pittsburgh, Pa.

With this new jack, it is now possible to meet all height requirements simply by cutting 2-in. pipe in lengths needed and attaching the Duff-Norton base and top fittings. According to the manufacturer, mine roof jack users need buy only these base and top fittings—cutting their own 2-in. pipe for the heights required. For different heights, the fittings, quickly

and easily attached, can be changed from one pipe length to another. The pipe columns can be used over and over as needed.

These jacks are available in two sizes: one of 8 tons capacity with a raise of 17 in. for use with standard 2-in. pipe; the other of 16 tons capacity, 17-in. raise, used with double strength 2-in. pipe. Heads for both models are made in four styles, ball and socket type, "H" and "I" types for H-beams and square timbers, or type "V" for round timbers, to meet all requirements. Handles are available in three styles, slide, drop, and wing nut.

A new descriptive bulletin giving complete details is now available. Copies may be secured from the company.

Non-Corrosive Pipe Elbows Offered

The Mosebach Electric & Supply Co., 1152 Arlington Ave., Pittsburgh, Pa., is now manufacturing a new line of non-corrosive pipe elbows for mine drainage use.

These pipe elbows which are made of anti-acid bronze, with high lead composition, are particularly resistant to mine acid water. Exhaustive

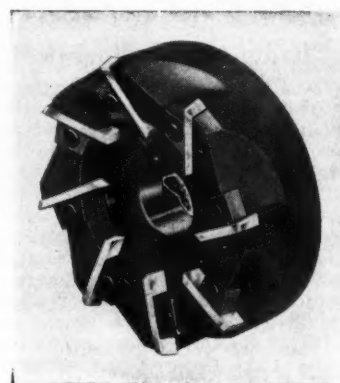


tests show unusual protection against acidity.

The company is in a position to make these castings to any specifications. They also make reducers with inside diameters from 8 to 6 in. Coal mine operators are requested to send blueprints along with inquiries.

"Universal" Face Kennamills

Kennametal, Inc., of Latrobe, Pa., has developed a new type of milling cutter, called the "Universal" Face Kennamill, which consists of a precision built heat-treated steel body, or tool holder, with a set of detachable solid Kennametal blades (as many as there are inches in the cutter diameter) mechanically held in position.



Five standard sizes are now available—4, 6, 8, 10 and 12-in. diameter. Blades for these are of the same cross section, and when shortened by regrinding, can be used in smaller cutters successively. They are "formed" at both ends, and can be used in either right or left hand cutters.

The face mill can be adapted for milling different materials simply by interchanging blades. Those having the proper grade of carbide and suitable cutting angles are inserted.

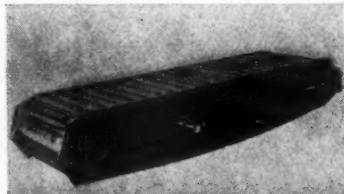
When the blades become dull they may be removed from the body, or tool holder, while it remains on the spindle, and sharpened on a standard surface grinder by a diamond wheel, while being held in a fixture, or grinding block, which is placed on the magnetic chuck in successive positions for accurate and uniform reshaping of the several cutting and clearance angles. This is a matter of minutes compared to hours required to resharpen cutters by the traditional method, on a standard cutter grinder. Resetting of sharpened Kennamill blades by hand is equally simple. The operation is quickly performed and requires no special skill.

Further information will be furnished upon request to the company.

New Long Life Chain Conveyor Reduces Power Consumption

Chain Belt Company of Milwaukee announces the production of a completely self-contained factory assembled heavy-duty apron conveyor unit. The heavy-duty roller-supported apron feeder is furnished in several widths and with centers ranging from a minimum of 4 ft., 7 in. to a maximum of 9 ft., 1 in., varied by 18-in. increments.

This type of feeder is widely used



under bins and hoppers for heavy lump material such as ore and pit-run gravel and rock and has exceptionally large capacity. At a normal speed of 10 ft. per minute, handling 100-lb. material, capacities of these standard units will run up to 80 tons per hour. Because the heavy steel chain belt rides directly on large diameter traction rollers, the design of the new heavy-duty feeder means longer chain belt life, and reduced power consumption.

For further information on heavy duty feeders or other conveyor problems, write Chain Belt Company, 1600 W. Bruce St., Milwaukee 4, Wis.

Standardization of Bearing Sizes Proposed by SKF

The nation's motor and machine manufacturers today were urged to join a movement to standardize sizes of ball and roller bearings just as sizes of electric bulbs, tires, clothing and shoes are standardized. This standardization, asserted S. F. Wollmar, executive vice president of SKF Industries, Inc., would reduce overall costs, speed delivery of bearings to prime reconversion centers, aid young industries, and broaden American participation in world reconstruction.

"Ball and roller bearing manufacturers are now required to produce and stock as many as 40,000 sizes and makes of anti-friction bearings," Mr. Wollmar said. "Some of these products differ from others by the merest hair's breadth. If a uniform system of basic sizes were adopted, it might be possible to concentrate our capacity on turning out about 2,000 sizes of bearings. These would meet almost every industrial need without any sacrifice of quality."

Wollmar said he was inviting reconsideration of standardized bearing dimensions now while memory of war production experience is still fresh. Standards adopted as long ago

as 25 years have been allowed to lapse, Wollmar said, because of the recent spectacular expansion of the machinery industry.

Turkish Coal Development

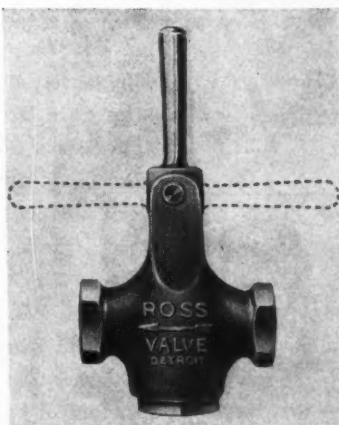
At the request of the Turkish Coal Commission, McNally Pittsburg Manufacturing Corporation of Pittsburg, Kans., is sending one of its coal preparation engineers, R. C. Woodhead, to that country to make surveys and proposals for coal preparation plants for beneficiation of Turkish coal along American lines.

The new coal development area is located in Asia Minor on the south shore of the Black Sea, at Zonguldak. The coal deposits are to be exploited under a Turkish Government 7-year-plan for industrial expansion. Turkey has been producing only three million tons per year; so any considerable increase of industrial capacity would be impossible without additional coal. The Zonguldak coal basin is 30 miles wide and 40 miles long and contains seven separate deposits.

New Shut-Off Valve

The Ross Operating Valve Company, 6415 Epworth Boulevard, Detroit 10, Mich., has just announced the addition of a shut-off valve to their already large line of poppet type, air operated valves. This new valve was primarily designed for use in air lines but is also recommended for use in gas and low pressure liquid lines.

Outstanding features claimed for this new valve are: (1) Full flow, that is to say, full pipe area. (2) Quick acting, just a flip of the lever opens or closes the valve. (3) Self-



locking, locks automatically in both closed or open position. (4) Positive shut-off, line pressure provides leak-proof seal. (5) Visual indicator, position of shut-off lever indicates whether valve is closed or open.

Four standard sizes are now in production, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, and $\frac{3}{4}$ -in.

Drafting Pencil Offers Freedom From Lead Breakage



A new refillable draftsman's pencil, ingeniously designed to eliminate the annoyance of broken lead, is announced by the Charles Bruning Company, 4654-8 Montrose Ave., Chicago 41, Ill. Said to be constructed on an entirely new principle, a new type of clutch holds the lead firmly in a non-slip rubber grip that prevents the usual nicking and scoring of lead which cause breakage. Light in weight and properly balanced, it is especially designed for engineers and draftsmen. Price, \$1.00.

CATALOGS AND BULLETINS

BATTERIES. *Gold Storage Battery Corporation*, Depew, N. Y. Catalog No. 300 presents details of construction and characteristic discharge curves in batteries specifically designed for mine shuttle car use. Two informative articles, one on the theory of the lead acid battery, and the other on care and maintenance, complete the catalog. Catalog No. 200 covers similar information on batteries for mine locomotives.


DIESEL TRACTORS. *The Caterpillar Tractor Co.*, Peoria 8, Ill. Form 9092 is a 24-page booklet with numerous photographs showing mining applications of "Caterpillar" diesel tractors. Records of endurance marks set by many older machines are also given.

DRILLING EQUIPMENT. *The Jeffrey Manufacturing Company*, Columbus 16, Ohio. Catalog No. 789 is a two-color, ten-page booklet with photographs of coal mine drilling equipment and diagrams of various set-ups and methods of machine mounting. Various details of machines are also pictured.

FINISHING WHEEL. *Manhattan Rubber Division of Raybestos-Manhattan, Inc.*, Passaic, N. J. Bulletin 6881-A describes Manhattan's new finishing wheels now available in several resiliencies with a synthetic rubber bond. The bulletin also contains a table of safe operating speeds for each type of polishing wheel bond.

MINE CARS. *American Car and Foundry Company*, 30 Church St., New York 8, N. Y. A 4-page bulletin on mine car detail with photo reproductions of three types of mine cars and a cut-away diagram of the ACF heavy-duty, double-action, spring bumper. The rocker type door closing device is also pictured.

SINGLE STAGE PUMPS. *Ingersoll-Rand Company*, 11 Broadway, New York, 4, N. Y. Bulletin 7057 is a 20-page, two-color catalog covering the design, construction and engineering details of its Cameron Single Stage general service pumps with pictures of typical installations, diagrams and cross sections.



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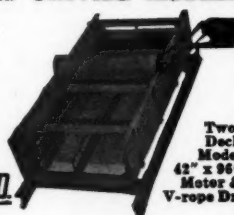
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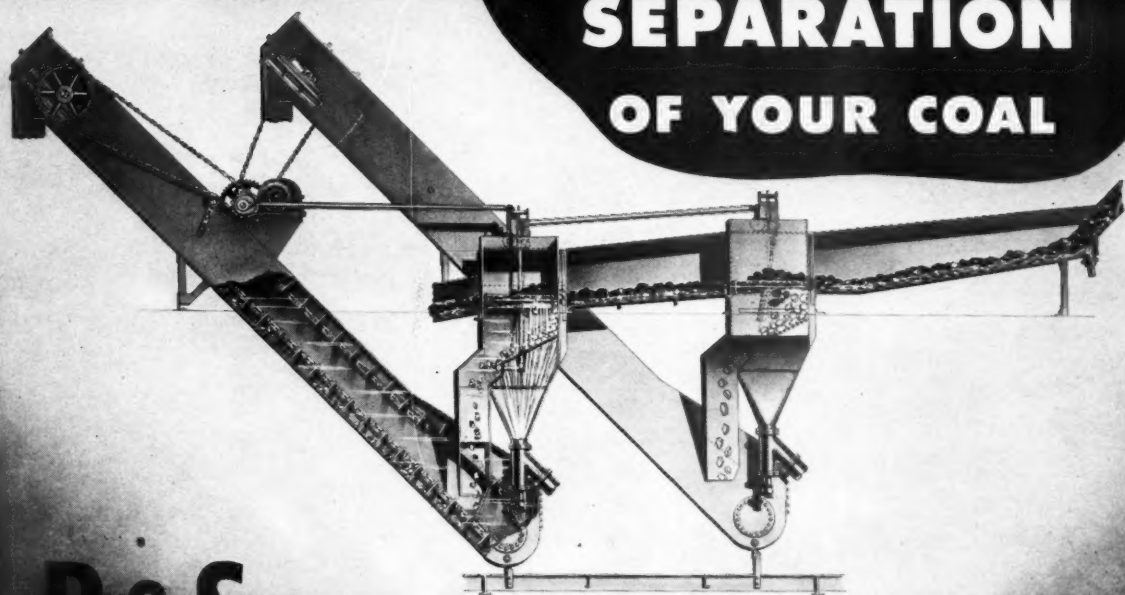
INDEX TO ADVERTISERS

	Page
American Car & Foundry Co.	Insert Between 4-5
American Chain & Cable Co., Inc.	5
American Cable Division	
Centrifugal & Mechanical Industries, Inc.	70
Chicago Pneumatic Tool Co.	69
Cleveland-Cliffs Iron Co., The.	15
Climax Molybdenum Co.	62
Colcord, F. Carl.	70
Cummins Engine Co., Inc.	20
Deister Concentrator Co., The.	73
DuPont de Nemours Co., Inc., E. I.	Second Cover
Edison, Inc., Thos. A.	Insert Between 4-5
Storage Battery Division	
Electric Storage Battery Co., The.	19
Gardner-Denver Co.	47
General Electric Co.	6-7
Gould Storage Battery Corp.	11
Harnischfeger Corp.	39
Hoffman Bros. Drilling Co.	80
Ingersoll-Rand Co.	21
I-T-E Circuit Breaker Co.	68
Jeffrey Mfg. Co.	2-3
Joy Mfg. Co.	42-43
Kennametal, Inc.	13
Loftus, Peter F.	70
Mack Trucks, Inc.	8
Macwhyte Co.	74
Marion Steam Shovel Co.	14
Mine Safety Appliances Co.	Back cover
Mott Core Drilling Co.	80
Ohio Brass Co.	22
Paulick, P. R.	70
Pennsylvania Drilling Co.	80
Reconstruction Finance Corp.	9
Roberts & Schaefer Co.	Third Cover
Robinson Ventilating Co.	80
Sauerman Bros., Inc.	72
Scott Aviation Corp.	10
Standard of California.	18
Tamping Bag Co.	72
Union Pacific Railroad.	12
United States Rubber Co.	4
Universal Vibrating Screen Co.	80
Westinghouse Elec. Corp.	16-17
Young, L. E.	70

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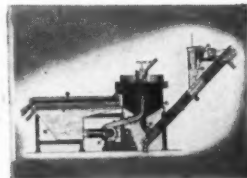
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